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ABSTRACT

This study investigated the effects of the first year of a state-of-the-art computer-based integrated learning system (ILS) on the learning and attitudes of students and the attitudes and technology skills of teachers. The ILS studied was the Wasatch Educational System, which was introduced in four elementary schools in the Metropolitan School District of Mount Vernon, Indiana, during 1990-1991. A total of 1,179 students and 120 teachers participated in the study. Scores of an additional 2,436 students from previous years were compared, making a total of 3,615 individual achievement tests used for the comparisons. Students were pretested on several criteria, including days absent from school, reading achievement, language arts achievement, mathematics achievement, the total achievement test battery, and cognitive skills index. Tests used for comparisons were the Indiana Statewide Test for Educational Progress for grades 1, 2, 3, and 6 and the California Achievement Test for grades 4 and 5. Among the attitudes tested were self-concept, attitude toward school, attitude toward computers, and skills students could do with computers, as well as total scores for all of these affective measures. Teachers were evaluated according to their attitudes toward instructional technology and teaching by an integrated learning system, and their skills in using instructional technology. Results were analyzed by a repeated measures analysis of variance. Almost all of the student achievement and attitudinal variables showed significant gains after the introduction of the ILS. Highly significant gains occurred in the teachers' perceptions of their ability to use computers and the ILS. The study confirmed that the ILS increased students' computer skills and attitudes and positively affected teachers' attitudes toward instructional technology. Appendices contain all statistical data, as well as the questionnaire survey instruments. (16 references) (DB)

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A Comprehensive Study of the Effects of an Integrated Learning System

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A Comprehensive Study of the Effects of an Integrated Learning System

A Report Prepared for the
Metropolitan School District
of Mount Venon, Indiana

by

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October, 1991

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Abstract

This study investigated the effect of the first year of a state-of-the art computer-based integrated learning system (ILS) on the learning and attitudes of students and the attitudes and technology skills of teachers . The Wasatch Educational System was introduced in four elementary schools in the Metropolitan School District of Mount Vernon, Indiana during the academic year of 1990-1991. A total of 1179 students and 120 teachers participated in the study. Scores of an additional 2436 students from previous years were compared, making a total of 3615 individual achievement tests used for the comparisons. The study was conducted in a way to ensure that guidelines for the effective use of an ILS were accounted for. Precautions were taken to ensure that teacher training, teacher involvement with the program, and match of the ILS curriculum with the local curriculum had all been accounted for.

Students and faculty were each pretested on several criteria. Among the criteria investigated for students were days absent from school, reading achievement, language arts achievement, mathematics achievement, the total achievement test battery, and cognitive skills index. In grade levels where the subtests were administered, science and social studies subtests were also compared. Tests used for comparisons were the Indiana Statewide Test for Educational Progress (ISTEP) for grades 1, 2, 3, and 6 and the California Achievement Test (CAT) for grades 4 and 5.

Each of these scores was compared to scores for the previous two years. Scores were computed for each grade level and for each of the four schools. Affective measures were also administered as pretests and posttests to determine whether students' attitudes were affected. Among attitudes tested were Self Concept, Attitude toward School, Attitude toward Computers, and skills students could do with computers, as well as the total score for all of these affective measures.

Teachers were evaluated according to their attitudes toward instructional technology, teaching by an integrated learning system and their skills in using instructional technology.

They also gave an estimation of the computer-related capabilities of their students at the beginning and the end of the year-long instructional program.

Results were analyzed by a repeated measures analysis of variance with the four elementary schools used as an additional independent variable. Achievement test scores were compared for entire classes of students in the 1988-89, 1989-90, and 1990-91 school years. Scores for individual students were also compared for these three years.

Almost all of the student achievement and attitudinal variables for students showed significant gains after the introduction of an ILS. Highly significant gains occurred in the teachers' perceptions of their ability to use computers and the ILS.

This study confirmed that the introduction of the ILS was well received by teachers and students, significantly increased students' computer skills and attitudes and positively affected the teachers' attitudes toward instructional technology and the perception of their ability to use computers and teach with an integrated learning system.

However, results of the student survey indicated that students had a lower estimation of their ability to use computers after the instruction had occurred. This was considered to result from their overestimation of their original abilities and a more realistic interpretation of their abilities after they had experienced ILS learning.

An unexpected finding concerning the achievement test measures was that many grades scored significantly lower on measures after their ILS instruction had occurred than they had scored in previous years. Both measures which compared the results of the entire grade over a three year period and the scores of individual students over a three year period showed significant losses after the introduction of ILS instruction. There were some significant gains for students in some grades.

Background of the Problem

Almost everyone agrees that our children are our future. It is the responsibility of society to be sure that the students of today receive the finest education that is possible. From the early days of the McGuffey Reader, the one room school house, and the whittling of nibs to ensure better writing to whatever technological advances lie ahead, educating our children must be our number one priority. However, as time changes, teaching methods change as well. The modern classroom is now moving in the direction of totally integrated learning systems (ILSs).

Since they are faced with the task of increasing students' achievement test scores, rather than examining the needs of their school districts, school officials are scrambling to obtain methods that can be readily implemented. The pressure to increase students' achievement test scores is so great that many school officials will choose a method that professes to guarantee results in spite of the cost of the method. Therefore, many school systems are choosing integrated learning systems . Trotter (1990) considers ILSs to be custom packages of computers, data storage devices, and instructional software.

The ILS is an instructional strategy that is a computer-based learning experience. Sherry (1990) has characterized an ILS as a networked system of multiple computers or terminals, a management system that collects and records the results of student performance, has options for generating a variety of printed reports, and often has a diagnostic/prescriptive program that assigns lessons to students based on individual progress. Sherry also concludes that the ILS courseware spans several grade levels and covers a portion of the math, reading, and language arts curricula. It makes available on-going upgrades and revisions of existing courseware, as well as giving purchasers reasonable assurance that additional courseware will be developed to run the system.

It is possible to link ILS lessons to an accepted standard curriculum. McCarthy (1989) considers the prime purpose behind the implementation of an ILS to be a focus on basic skills, such as those that are usually considered to be basic to reading, language arts, and mathematics. ILS courseware may include tutorials, drill and practice exercises, tests, and can also include a variety of multimedia components, such as a thesaurus and a pictured encyclopedia.

Many of the companies that sell these packages are familiar names in the school marketplace. Among them are Computer Corporation, WICAT, Jostens Learning, Ideal Learning, Computer Systems Research, Wasatch Educational Systems, and the Unisys Corporation. Many custom packages are available, each having characteristics that attract buyers. Sales personnel promote their product by informing schools that an ILS is the best hope for increasing the learning ability of a wide variety of students and concomitantly increasing the achievement of a wide variety of students being taught.

Although many schools districts are purchasing ILSs, there are many controversies surrounding their use. ILSs are attractive to many school districts because these systems "offer schools their best hope for education an increasingly diverse population" (Trotter, 1990). However, there are several critical issues which greatly influence the effectiveness of an integrated instructional system. Sherry (1990) considers some of these to be original and on-going costs, integration into the school's instructional life, and staff training. Furthermore, Trotter concludes that while proponents of ILSs say that these companies' products offer schools their best hope of educating an increasingly diverse population of students, some skeptics think that these purchases are an unnecessary expense.

Cost. Several attempts have been made to estimate the dollar amount that schools spend annually on ILSs. Sherry (1990) finds that integrated instructional systems are being purchased by an increasing number of school districts each year Trotter (1990) reported that half a billion dollars is being spent annually on ILSs by local school districts. Integrated instructional systems are expensive. These systems are sold and serviced by a single vendor. Trotter (1990) cites a report by the Educational Products Information Exchange (EPIE) which estimated that "equipment, software, and installation costs for thirty computers will cost from $25,000 to $250,000 depending on the complexity of the system. The report also estimates that "district wide purchases can run into the millions." In addition to the fees for equipment, installation, and software, ILSs have many hidden costs. Sherry (1990) discovered that vendors often forget to mention that sustaining an instructional system is an on-going annual expense, and Trotter (1990) found that "most systems have an on-going annual expenses that range from $10,000 to $30,000 per computer lab." These expenses are in the form of contracts, licensing fees, and software upgrades. Other costs include a budget for staffing, addition of new classrooms in which to house computer labs, necessary electrical wiring, inservice training, and staff development.

Curriculum. ILSs should be incorporated into the school's regular instruction. According to Trotter (1990), "integrated systems which are carefully selected and well matched to a school's needs and/or curriculum can be a good investment." ILSs combine new educational technology with the strengths of computer systems which started drill and practice for students thirty years ago. Nevertheless, Rudowski and Hofmeister (1991) claim that ILSs only offer a variation of the theme of drill and practice.

ILSs drill, evaluate, and monitor each student's progress. Thomas and Turner (1990) claim that through an ILS, students' needs are evaluated and a path or level is made available that is based on that evaluation. Students work their way through the lessons or simulations, but Sherry (1990) revealed that "little attempt is made to coordinate the students' ILS activities with the rest of their instructional life." When administrators were asked if they had restructured their curriculum as a result of adding an ILS, the answer was almost always "no."

Furthermore, the use of computers in a computer laboratory setting has tended to isolate the system from the rest of the school. Rudowski et al (1991) consider ILS instruction as the equivalent of cramming for a test. They also found that this method may actually bring results with regard to a specific test, but they feel that meeting the long-range goals of restructuring (independent, responsible learning) is very doubtful.

Staff development. Cosden et al (1987) point out that teachers need to maintain an active presence in ILS learning, since it is they, and not the software itself, that makes the distinction between whether students achieve or not. ILSs can be a valuable asset to education. However, teacher training is necessary if ILSs are to be useful and worthwhile. Trotter (1990) asserts that "educational technology experts recommend that schools invest in personnel training an amount approximately equal to the total expenditure on hardware and software." However, Sherry (1990) found that "teachers were rarely advised on how to integrate the ILS into regular classroom activities. The computer lab must be demystified and classroom teachers must play an integral role in its use. The EPIE report cited by Trotter concluded that "teachers need more time and training to coordinate and incorporate an ILS into classroom activities." Sherry concluded that for an ILS to be successful, teachers must be given the time and training necessary to understand how to take advantage of its strengths.

Satisfaction. Trotter (1990) advises that these systems are generally viewed positively by the majority of students, teachers, and administrators. Even though these perceptions are always based on gut feelings rather than any hard data, such a widespread favorable response suggests that ILSs will continue to proliferate in schools. The top three things that teachers liked about their ILS were individualized instruction, match with the curriculum, and color graphics. Administrators also rated individualized instruction first, then reporting capabilities followed by completeness of content, match with curriculum, and ease of use.

Reasons ILS May Be Beneficial to Learning

Practical Reasons. One of the advantages of using an ILS rather than computer assisted instruction is that time is not wasted booting up individual diskettes. Both Alifrangis(1990) and Trotter (1990) find that using a network eliminates the problem that comes from a mountain of floppy disks.

By removing "housekeeping" and management responsibilities from the teacher, an ILS increases the probability that the teacher will accept this kind of instructional method.

The software's consistent authorship and "look and feel" make using it easy. Trotter (1990) finds that learning to use any well-designed piece of software is no sweat for today's kids, who are adept at the controls of a host of computer games.

Teachers. Trotter (1990) finds that technology frees teachers up to do other important tasks. As instruction becomes more high-tech, teachers must be able to help students become more effective problem solvers. The ILS is a flexible tool which teachers can use as they decide what strategy is most appropriate to their particular instructional needs Taylor (1990) finds that It is possible for the ILS curriculum to be totally coordinated with the districts' curricula. Taylor also considers the ILS to be structured, yet its flexibility enables the teacher to conform it to his/her own teaching style and the needs of his/her students.

The Jostens Learning System, as cited by Taylor (1990) indicates that its lessons closely parallel the scope and sequence of major basal textbooks and address concepts measured by standardized tests.

Technology. Taylor (1990) finds that the ILS program consists of "learning experiences that use full-color technology, animation, music, digitized human voice, and mouse and keyboard input throughout the entire curricula both to motivate and teach. Alifrangis (1990) finds that the programs are attractive, attention-focusing, and motivating.

Mageau (1990) considers the single most impressive feature of many ILS is the management system that can individualize learning for all users

Taylor (1990) considers computer based learning systems to be the most powerful tool with which to restructure and vitalize public education. Further, Mageau (1990) concludes that ILS can individualize instruction and has been shown by research to increase test scores of low achieving students.

Smith and Sciafani (1989) have discovered that it is common to find that teachers who are loaned integrated teaching systems "for evaluation purposes" or for "pilot studies" fall in love with them immediately and are loath to give them up. Alifrangis agrees and hypothesizes that few problems exist because students are kept so busy in the lab that they have neither the time or the inclination to fool around.

Reasons ILS may not succeed.

Lack of teacher involvement in learning. In spite of the favorable reviews that teachers gave, most said that they don't use the system themselves; they prepared lessons and reports, graded papers, or even considered the computer time for students as free time for themselves. Some ILSs have non-professionals in charge of the total management system. One of the benefits of such a system is to allow more contact between the teacher and the students and it is of vital importance that this interaction be maintained. An ILS can provide the perfect scenario for developing rapport between teacher and students, but this can only happen if teachers are actively involved in ILS instruction.

Some teachers look upon the ILS as an intrusion into their classroom and their teaching style. Trotter (1990) finds that the systems displace teachers' professional skills, depriving them of their opportunity to "perform" and reduce their participation in students learning. He further concludes that if managers of ILS laboratories are treated like low-paid technicians or babysitters, they will hoard their knowledge and control and teachers will slip away to grade papers.

The ILS program. Sherry (1990) finds that when an ILS is used, little attempt is made be coordinate the students' ILS activities with the rest of their instructional life. Trotter (1990) quotes Peter Kelman who concluded that microcomputers are really not able to do diagnosis and prescription better than even a mediocre teacher. Smith and Sclafani (1989) conclude that teaching the same subject according to conflicting theories (discovery learning used by the teacher and direct instruction used with an ILS may be counterproductive.

Staff training. Sherry (1990) concludes that staff training in the use of an ILS for instruction has been grossly neglected.

Research findings.

Debating whether ILSs are helpful or a hindrance to learning will probably continue as long as the systems are being used. Research studies may help to resolve some of the controversy surrounding these systems. However, Andrew Trotter (1990), Mark Sherry (1990), and Henry Becker (1990) each have found that previous studies have been of such poor quality, were seriously flawed, and are typically inconclusive that the results of them have been meaningless. It is curious that Becker's judgment of their quality is so harsh, because his own research is so flawed that it amounts to an anthology of things not to do in an educational research study. Among Becker's follies are invalidities resulting from the comparison of non-equivalent groups, regression to the mean, and the Hawthorne effect.

Another example of a flawed study was one conducted by Catherine Alifrangis (1990) in the Fairfax County (Virginia) Public Schools. Comparisons of the control and experimental groups did not give statistically significant results. However, Alifrangis concludes that the gains in both groups were larger than expected, and the bottom group gained most. Apparently Alifrangis did not consider the possibility of regression to the mean.

Norton and Resta (1986) attempted to improve the effect of the WICAT ILS on reading improvement for students in four selected schools in the Albuquerque (New Mexico) Public Schools. Norton and Resta concluded that some of the very young students did not profit from WICAT and they were returned to more traditional educational programs. They further concluded that students entering the fourth through sixth grades benefited more from ILS instruction supplemented by problem solving and simulation software than from skills instruction.

In Calvert County, Maryland, the school corporation showed a great increase in test scores over a five year period. However, Trotter (1990) concludes that an ILS was not the only factor that could have contributed to the gains. The school corporation had developed an entirely new curriculum for use with the system.

Sherry (1990) found two disturbing factors about using an ILS. First, almost none of the teachers had been advised on how to integrate the ILS into their regular classroom activities. Second, most of the schools could be making more effective use of their ILS.

A study by Henry Becker (1990) found that all resource teachers at Bonnheim Elementary School in California felt that ILS had a positive effect on the academic achievement of Chapter I students and all principals indicated current Chapter I students who were using ILS appeared to be more interested in learning.

If an ILS is an effective method for enhancing student learning, increasing student test scores, increasing student and teacher attitudes, and increasing student and teacher proficiency in computer utilization, then the mean posttest scores of students and teachers in each of these variables should be significantly higher than the mean of the scores of the corresponding pretest.

Statement of the Problem

The general area of this investigation focused on the question "How can attendance, basic skills achievement, cognitive skills, computer skills, and student attitude and the instructional technology attitudes of teachers and students be improved?"

Specifically, this study investigated the problem "Can these variables be improved through the introduction of an integrated learning system by means of a laboratory and a distributed laboratory into four elementary schools?"

The hypotheses investigated in this study will be: There will be no changes in these variables as a result of the introduction of an integrated learning system into the four elementary schools of the Metropolitan School District of Mount Vernon, Indiana.

Methodology

Subjects. Subjects who participated in the study were 1179 students in grades K-6 and 120 teachers of the Metropolitan School District of Mount Vernon, Indiana. The students were enrolled in classes and the teachers were employed by the school district during the 1990-91 school year. In addition to the Subjects, scores from 1229 students for the 1988-89 school year and 1207 students from the 1989-90 school year were used for comparisons. A total of 3615 test batteries were compared in the study. These scores were for all of the students enrolled in the school district during the three academic years.

Mount Vernon is a community of 8500 citizens. Principal areas of employment in the community are large and small industries, farming, river transportation, businesses, and the professions. The school district is typical of medium size school districts in the Midwest.

Equipment and materials. An ILS consisting of Wasatch Software, other software, and IBM PS2 Model 25 and PS2 Model 30 computers was installed in each of the four elementary schools. Thirty networked computers were installed in a central computer instructional laboratory in each of the schools.

Depending on the grade level, there were also 1-3 computers in each classroom. These computers were also a part of the total school network.

Software selections were controlled by a server which accessed learning activities as prescribed by individual classroom teachers.

Instruction. Students in grades K and 1 participated in two one hour sessions of ILS instruction each week. Subjects in grades 2-6 participated in three one hour sessions of ILS instruction each week. Students in the fourth grade at Farmersville Elementary School participated in a Buddy System project. They also learned about data bases, spread sheets, and telecommunications. The Farmersville fourth grade students also communicated by modems with students from other Buddy System sites.

Measures. Data documenting student absences and achievement and cognitive skills measures were obtained from the cumulative records of project participants for the two years prior to the beginning of the project (1988-89 and 1989-90) and toward the end of the first year of the project (1990-91). Teachers and students were administered attitudinal measures and measures of their computer proficiency at the beginning of the project and at the end of one academic year of the project. Specific measures were :

Absences. Records of absences were obtained from the students' cumulative records for each of the two school years prior to the project and for the beginning year of the project.

Achievement test scores. Students in grades 1, 2, 3, and 6 were tested by the Indiana Statewide Test for Educational Progress (ISTEP). Students in grades 4 and 5 were administered the California Achievement Test (CAT). Subtest scores in Reading, Mathematics, and Language Arts were available for most grades. In addition, subtest scores for Science, Social Studies, and scores for the total battery were analyzed in the grade levels in which these tests were administered.

Cognitive Skills Index (CSI). Cognitive Skills Indexes were analyzed for grades 3, 4, and 5. The CSI is a measure which is highly correlated with measures of Deviation Intelligence Quotients (DIQ) except that the CSI mean for any group tends to be somewhat higher than the DIQ mean of 100.

Student attitude. A student attitude measure was constructed from previous measures that had been developed for instructional computer projects. The questionnaire was divided into four subtests. These were as follows:

Items	Subtest
1-20	About Me (Self Concept)
21-30	About My School (Attitude toward School)
31-40	About Computers (Attitude toward Computers)
41-54	What I Can Do With Computers (Computer Skills)
1-54	Total Test (Composite Score of Four Subtests)

Each of these subtest consisted of Likert Bipolar Attitude Inventory items. Pretest and posttest reliabilities were computed and were found to be:

Items	Subtest	Reliabilities	
		Pretest	Posttest
1-20	About Me	.80	.86
21-30	About My School	.87	.90
31-40	About Computers	.85	.90
45-54	What I Can Do with Computers	.80	.94
1-54	Total Test	.90	.94

Faculty questionnaire. The questionnaire administered to 120 teachers who participated in the project was divided into three sections. Items 1-7 sought to determine the teachers' perceptions concerning their levels of development in the use of instructional technology. These items were based on a measure developed by Dr. James Tarwater of the South Bay School District of Imperial Beach, California. His questionnaire form was developed from a Concerned-Based Evaluation Model and measured the levels of teachers' Knowledge, Information, Communication, Assessing, Planning, Status Report, and Performing.

The second part of the questionnaire was an Osgood's Semantic Differential consisting of nine items to ascertain the teachers' attitudes toward teaching through instructional technology. An addendum to the posttest required teachers to estimate the percentages of students who could perform specified computer skills at the beginning of the year and at the end of the year.

Analysis. All measures except attendance were scored by mark sense methods. Data were analyzed by repeated analyses of variance using the SPSS-X statistical package. Where post hoc comparisons were required, Tukey's W Procedure was used to determine which pairs of means possessed differences large enough to be statistically significant. Although results were first tested for significance at the .05 level, the actual levels of significance are also reported.

Results

Student Comparisons

Absences. Table A-1 contains the mean number of absences for the number of days absent from school per year for those students who were enrolled for three years at Mount Vernon. It will be noted that the number of absences decreased significantly for students enrolled in grades 2, 3, and 5. There were no significant differences between the mean numbers of absences between the four schools. There was significant interaction for grade four, due to the fact that there was a greater decrease in absences at Farmersville compared to the other three schools.

Reading. Table A-2 contains the means for the Reading Subtest for the schools that participated in the project. It will be noted that there is a significant decrease in the means for students who are presently in grades 2, 4, and 5. There is also a significant difference between the schools . However, no statement can be made about trends in this category, since various schools scored highest and lowest at different grade levels. A similar statement can be made about the interaction, since various schools increased or decreased more at a given grade level.

Language Arts. The Language Arts Subtest results are contained in Table A-3. Significant decreases occurred for both years in which Language Arts subtests were administered. However, it is fair to say that Language Arts did experience a slight increase during the project year as compared to the previous year. It may be noted that Language Arts scores tended to be higher at Marrs in the fourth grade and at Farmersville in the fifth grade. The significance for interaction that occurred in the fifth grade was because of a different trend for the decrease at Farmersville.

Math. Mathematics scores found in Table A-4 indicated significant decreases in more recent years. A general statement concerning these decreases is that the decreases at Farmersville were not as dramatic as the decreases at the other schools.

Total Battery. Total Battery Scores, contained In Table A-5, were significantly lower in grades 4 and 5. Marrs scored higher in grade 4 and Farmersville scored higher in grades 3 and 5. However, Marrs also showed the greatest decrease in Grade 4 and West showed the greatest decrease in Grade 5.

Cognitive Skills Index (CSI). Cognitive skills measures were only performed in Grades 2, 4, and 5 and are reported in Table A-6. No comparisons could be made between previous years for students in Grade 2. CSI measures changed significantly, but it was only in Grade 5 that a significant decrease occurred and that decrease was only in relation to the first comparison year. The significance of the increase in Grade 4 was largely between the first two years, and no statement can be made relating the project to an increase. One trend that seems to predominate is that there are lower CSI means for Hedges Elementary School than for the other three. The interaction effects were not significant.

About Me (Self Esteem). The self esteem measure is analyzed in Table A-7. There were significant increases in self concept for grades 2 and 3, while there was a significant decrease for Grade 4. Although there were some differences at various grade levels between schools, no trend was noted. There were no significant interaction effects.

About My School (Attitude Toward School). Significant differences in attitudes toward school, contained in Table A-8, favored the posttest, except that in Grade 1 the increase was not statistically significant. The only significant difference between schools occurred at Grade 1, where Farmersville and Marrs scored significantly higher than Hedges and West Interaction effects in Grades 4 and 5 were largely due to the fact that all other schools except Farmersville increased.

About Computers (Attitude Toward Instructional Technology). Table A-9 contains the results of the measure of the students' attitudes toward instructional technology. It will be noted that highly significant increases occurred at every grade level except for Grade 1. Although scores in Grades 1, 2 , and 3 were higher at Farmersville, the mean score at Hedges was higher for Grade 4 while Marrs scored highest for Grade 5. No significant interaction effects were noted for any grade except for grade 4 in which Farmersville showed a slight decrease.

What I Can Do with Computers. An unexpected result of this study was the lower mean scores on the posttest, as illustrated in Table A-10. These results were highly significant for Grades 3, 4, and 5. Various schools scored higher at different grade levels. No trends were noted that were due to interaction.

This result appears to be due to the lack of understanding of the students on the pretest and a more realistic appraisal of their abilities once they had participated in this computer-based instruction.

Total Attitude. Total attitude scores, contained in Table A-11, were significantly higher in grades 2, 3, and 5. Attitude scores for grades 1 and 2 were higher at Farmersville and attitude scores for grades 4 and 5 were significantly different without noticeable trends. The only significant interaction occurred in Grade 4, where Marrs was the only school that experienced an increase.

Gains or Losses at Schools for Successive Years.

Grade 1. The results for Grade 1 are contained in tables B-1 and D-1 of Appendix B and D respectively. Means of the scores showed significant losses in Math and Reading subtests. Grade 1 scores from West Elementary School showed the largest decreases and the lowest mean.

Grade 2. Grade 2 results are reported in Tables B-2 and D-2. There were significant losses in almost all measures. The only exception was that there was no decrease in the reading measure for the 1989-90 to 1990-91 comparison. Significant one year losses at grade two were noted for Marrs school, while the scores at the other schools did not show large differences between their means.

Grade 3. Grade 3 scores, contained in in Tables B-3 and D-3 showed several significant losses and a one year gain in reading. Grade 3 scores were largely year to year variations. Grade 3 losses were greatest at West Elementary School.

Grade 4. Tables B-4 and C-4 showed increases that were often significant. Reading and science were the only subjects that did not demonstrate significant gains. Farmersville, Hedges, and Marrs all experienced large gains that occurred as a result of their Grade 4 instructional programs.

Grade 5. Grade 5 students experienced significant gains in Math, Language Arts, and Science Subtest scores. The composite score was significant only for the 1988-89 to 1990-91 comparisons. Farmersville and West Elementary Schools experienced the largest gains.

Grade 6. Grade 6 students experienced significant gains in Math. However, there was virtually no difference in the scores for the Total Battery. Hedges was the only Grade 6 school that demonstrated a continuing increase.

Teacher Questionnaire.

The results for the teacher questionnaire are contained in Tables C-1 to C-30 of Appendix C. The first seven items measured the teachers' perceptions of their ability to use instructional technology in their teaching. Results of each of these items showed highly significant (p <.0001) gains between pretest and posttest.

The C-8 to C-16 items compared the teachers' attitudes concerning the use of instructional technology. These items generally indicated a more positive attitude for posttest scores. However, the teachers' means on the Time-Saving to Extra Work continuum indicated that teachers considered the ILS to be more toward the Extra Work end of the scale on the posttest.

Significant gains occurred on the Threatening-Welcome, Fascinating-Boring, Positive-Negative, and Relaxed-Tense comparisons.

No significant differences were found on the Good-Bad, Beneficial-Worthless, Helpful-Hindrance, or Active-Passive comparisons.

The teachers' responses to how their students could use computers were all highly significant (p<.001 and p<.0001) for all items. Teachers feel that many more of their students can now use computers to write a report or story, play games, practice math, learn to read better, learn about science, do a science experiment, learn to type, send messages, take notes, use a calculator, check spelling, do word processing, plan their writing, and organize.

Discussion, Conclusions, and Recommendations

This study investigated the effect of the introduction of an integrated learning system (ILS) on students' achievement, abilities, and attendance at school. It was ascertained that significant differences occurred in the attendance rate, attitude, and computer-related abilities of students. However, an unexpected finding was that the year to year means of the school system and the year to year means of students often were often lowered during the initial year of the project.

Perhaps some of the instructional activities normally devoted to learning basic academic skills was utilized in teaching students to keyboard and to use the ILS. It is also possible that there could have been a more congruent match between the ILS learning and the State curriculum. Accordingly, it is possible that Wasatch taught concepts that were not measured by ISTEP or the CAT.

A third possibility is that the use of an ILS can take time from the teachers' contact with individual students, which is a key ingredient to learning in the early years.

It is fair to say that the introduction of an ILS has not produced significant gains in achievement in Mount Vernon, but more compelling questions are whether there have been some resultant losses and what can be done to turn this trend around.

More careful attention will be needed to cause teachers to learn what is necessary to help their students to benefit most from the capabilities of an ILS.

Careful coordination must be given to the curriculum, testing, and computer-related activities so that the ILS can be a valuable asset to the learning of young boys and girls. Additional studies to be conducted at a later date will ascertain whether students will benefit more from ILS instruction in future years.

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Table A-1
Means of Students by School and Year
Absences

Grade	Years	F	School H	M	W	Total	Analysis. of Variance Source	F	Sign.
K (n=141)	90-91	7.9	6.0	- -	9.0	7.7	Schools	1.54	0.22 n.s.
1	89-90	6.7	7.1	6.6	10.9	7.9	Schools	2.16	0.95 n.s.
(n=154)	90-91	6.5	7.9	7.0	7.5	7.2	Year	1.35	2.47 n.s.
							SxY	4.12	.008
2	88-89	7.3	8.7	9.5	6.7	8.0	Schools	.04	.991 n.s.
(n=161)	89-90	6.9	6.0	6.1	8.4	6.9	Year	7.28	.001
	90-91	6.0	5.5	4.9	4.3	5.2	SxY	1.57	.156 n.s.
3	88-89	7.5	6.0	6.9	5.8	6.5	Schools	.62	.604 n.s.
(n=200)	89-90	6.2	5.7	5.7	7.4	6.3	Year	7.28	.001
	90-91	6.9	5.5	4.7	5.2	5.7	SxY	2.02	.06 n.s.
4	88-89	9.0	7.7	7.8	6.4	7.7	Schools	.60	0.62 n.s.
(n=186)	89-90	6.0	5.8	5.6	6.3	6.0	Year	2.62	.07 n.s.
	90-91	5.4	6.4	3.6	5.5	5.0	SxY	2.65	.03
5	88-89	6.5	5.9	7.5	6.6	6.5	Schools	1.04	.378 n.s.
(n=207)	89-90	7.1	4.8	6.5	6.6	6.2	Year	5.01	.007
	90-91	7.1	5.1	4.5	5.2	5.5	SxY	2.37	.03

Means of Absences

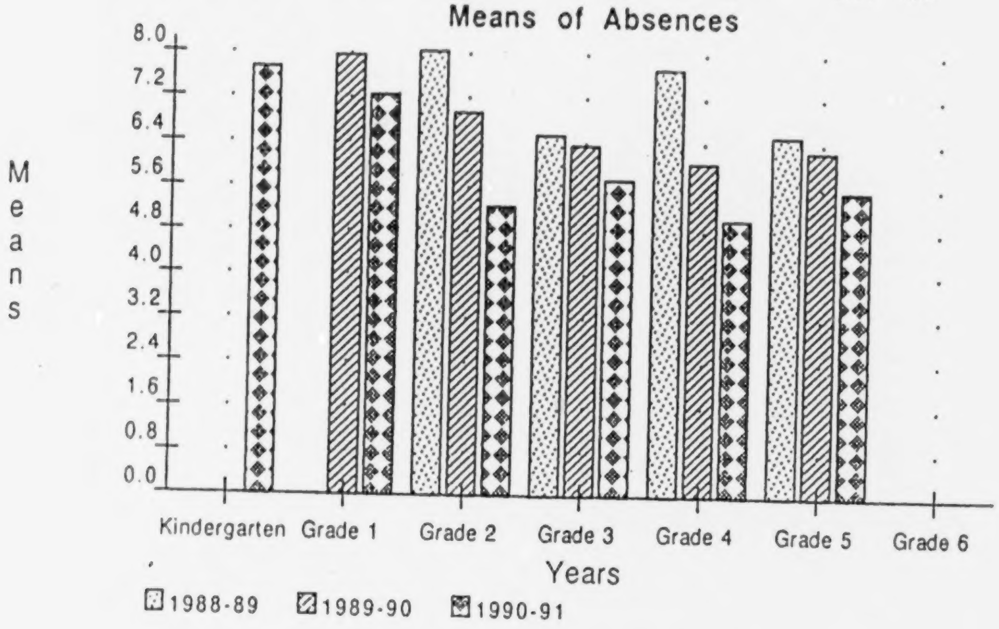

Table A-2
Means of Students by School and Year
Reading

Grade	Years	F	School H	M	W	Total	Analysis of Variance Source	F	Sign.
K (n=141)									
1 (n=156)	90-91	69.8	62.5	59.9	55.7	61.5	Schools	2.87	0.38 n.s.
2 (n=162)	89-90	58.6	72.7	62.0	62.3	63.3	Schools	.86	.464 n.s.
	90-91	60.9	59.3	60.2	63.5	61.1	Year	4.66	.032
							SxY	6.06	.001
3 (n=195)	88-89	66.1	67.4	61.6	61.2	64.1	Schools	2.11	.100 n.s.
	89-90	65.1	59.6	59.1	57.2	60.3	Year	12.37	.0001
	90-91	71.3	65.0	57.1	68.1	66.0	SxY	4.83	.0001
4 (n=184)	88-89	58.5	61.0	66.3	56.2	60.4	Schools	3.88	.01
	89-90	58.8	60.3	67.4	60.3	62.0	Year	6.71	.002
	90-91	56.3	59.2	64.1	53.7	58.2	SxY	.99	0.44 n.s.
5 (n=207)	88-89	62.4	54.8	60.0	62.7	59.8	Schools	4.07	.008
	89-90	60.1	51.8	59.4	58.1	57.1	Year	14.1	.0001
	90-91	64.2	48.1	56.8	56.1	56.1	SxY	5.45	.0001

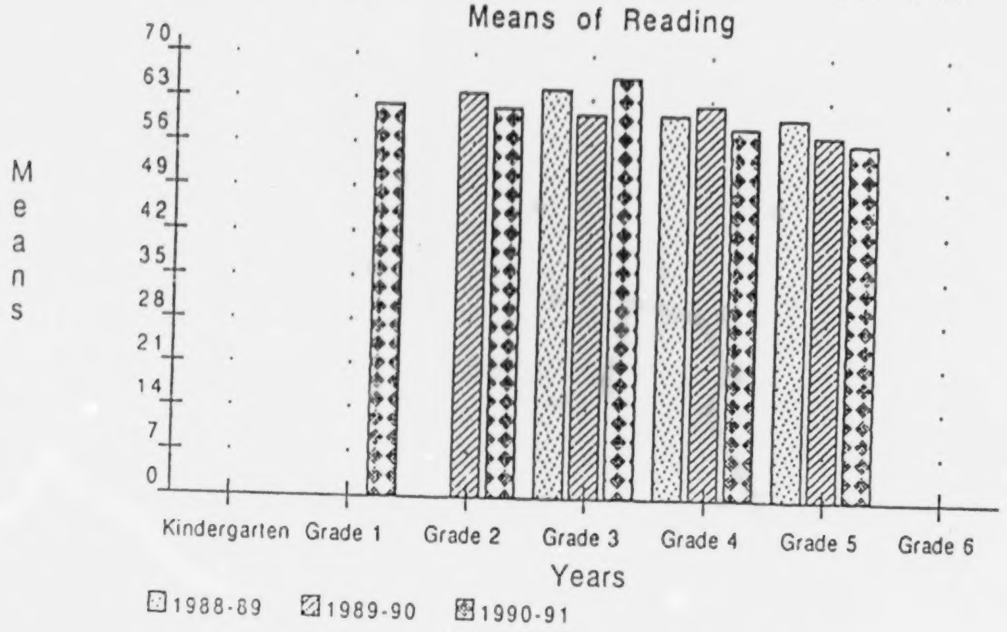

Table A-3
Means of Students by School and Year
Language

Grade	Years	F	H	M	W	Total	Source	F	Sign.
		School					Analysis. of Variance		
K (n=141)									
1 (n=156)	90-91	76.1	66.1	68.7	58.9	67.2	Schools	5.12	.002
2 (n=188)	90-91	60.9	64.4	66.0	65.2	64.2	Schools	.52	.067 n.s.
3 (n=195)	88-89			62.9			Schools	4.09	.008
	89-90	74.3	65.0	67.6	63.8	67.6	Year	1.41	n.s.
	90-91	77.7	68.5	66.9	63.9	69.2	SxY	2.42	.05
4 (n=184)	88-89	63.8	68.4	72.7	58.5	65.4	Schools	4.04	.008
	89-90	65.0	66.0	72.4	64.6	67.2	Year	7.24	.001
	90-91	60.9	61.8	68.0	59.7	62.8	SxY	1.42	0.20 n.s.
5 (n=207)	88-89	74.2	63.4	68.5	73.2	69.7	Schools	4.52	.004
	89-90	60.3	53.3	58.5	56.3	56.9	Year	88.5	.0001
	90-91	72.5	55.5	58.1	57.9	61.0	SxY	6.71	.0001

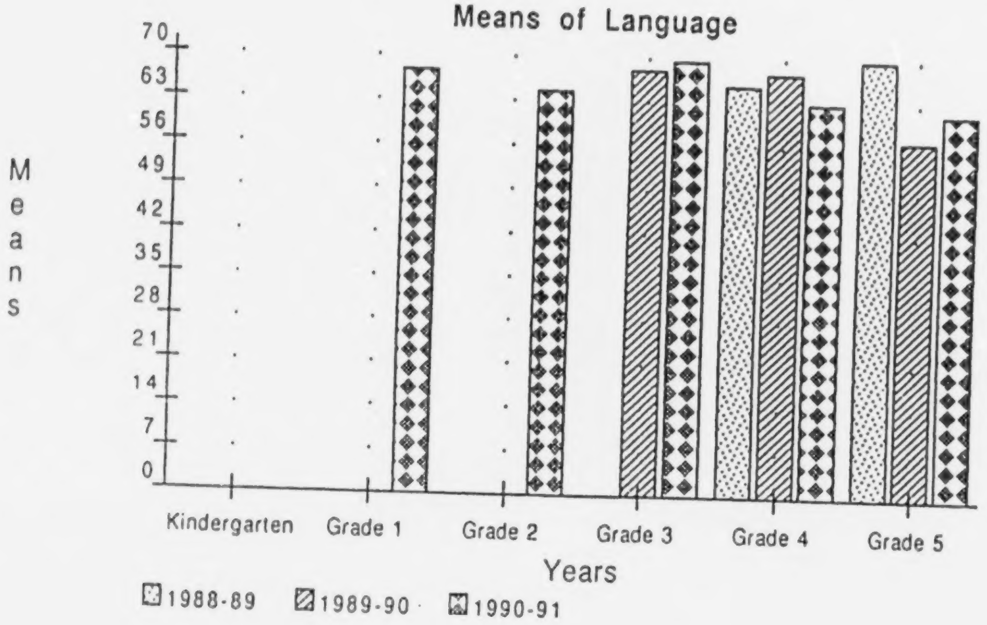

Table A-4
Means of Students by School and Year
Math

Grade	Years	School F	 H	 M	 W	 Total	Analysis. of Variance Source	 F	 Sign.
K (n=141)									
1 (n=157)	90-91	79.1	77.0	71.4	66.8	73.1	Schools	2.81	.042
2 (n=171)	89-90	76.0	80.7	80.4	75.4	77.9	Schools	1.59	.194 n.s.
	90-91	74.4	64.7	56.0	63.1	64.2	Year	102.36	.0001
							SxY	12.79	.0001
3 (n=195)	88-89	75.5	77.2	74.7	73.8	75.3	Schools	1.53	.208 n.s.
	89-90	68.5	69.4	60.4	64.9	66.1	Year	32.04	.0001
	90-91	72.2	68.1	68.9	61.1	67.3	SxY	12.79	.0001
4 (n=184)	88-89	63.3	65.6	73.1	59.5	65.4	Schools	4.04	.008
	89-90	63.4	72.2	66.6	67.2	67.2	Year	7.24	.001
	90-91	60.9	61.1	68.4	59.9	63.3	SxY	1.53	0.24 n.s.
5 (n=207)	88-89	66.8	58.1	67.3	65.9	64.2	Schools	3.09	.03
	89-90	61.2	53.5	65.6	60.1	59.7	Year	20.9	.0001
	90-91	65.3	54.4	56.9	59.3	59.0	SxY	4.43	.0001

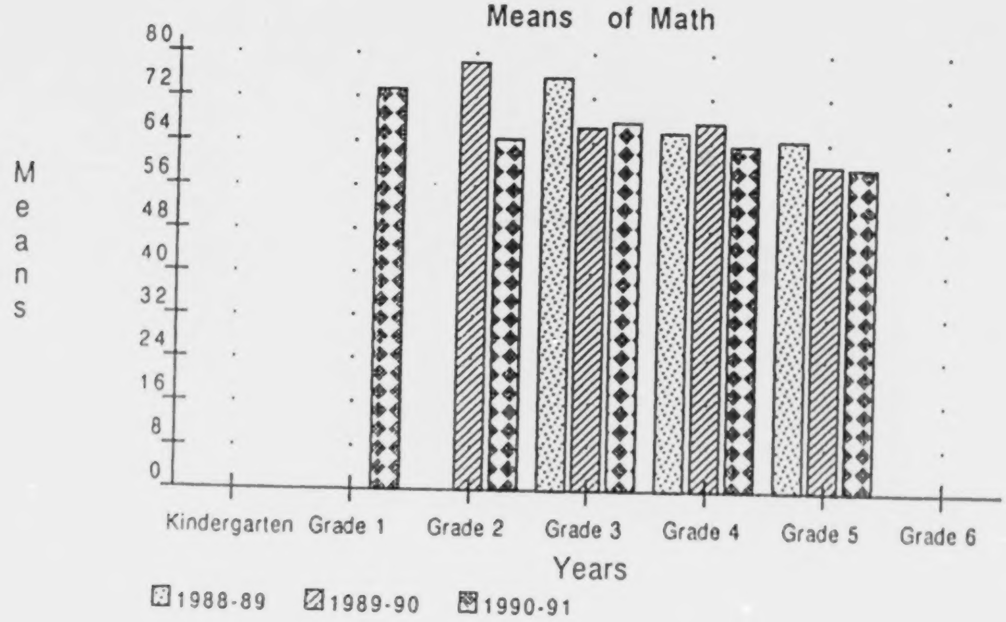

Table A-5
Means of Students by School and Year
Total Battery

		School					Analysis. of Variance		
Grade	Years	F	H	M	W	Total	Source	F	Sign.
K (n=141)									
1 (n=156)	90-91	77.2	70.4	68.3	61.6	69.0	Schools	3.69	0.01
2 (n=188)	90-91	67.9	63.6	60.2	64.5	64.0	Schools	1.08	0.36 n.s.
3 (n=195)	89-90	68.6	72.8	63.4	65.8	67.6	Schools	2.68	.05
	90-91	71.9	67.5	64.5	64.8	67.5	Year	0.91	n.s.
							SxY	4.51	.002
4 (n=184)	88-89	63.3	65.6	73.1	59.5	65.4	Schools	3.94	.009
	89-90	63.5	64.1	72.6	66.6	67.2	Year	15.1	.0001
	90-91	60.9	61.1	68.4	57.9	62.3	SxY	3.21	.004
5 (n=207)	88-89	67.1	58.7	66.5	67.9	64.8	Schools	3.60	0.01
	89-90	60.9	52.6	61.4	58.6	58.1	Year	57.1	.0001
	90-91	68.5	53.1	58.2	57.9	59.3	SxY	9.05	.0001

Means of Total Battery

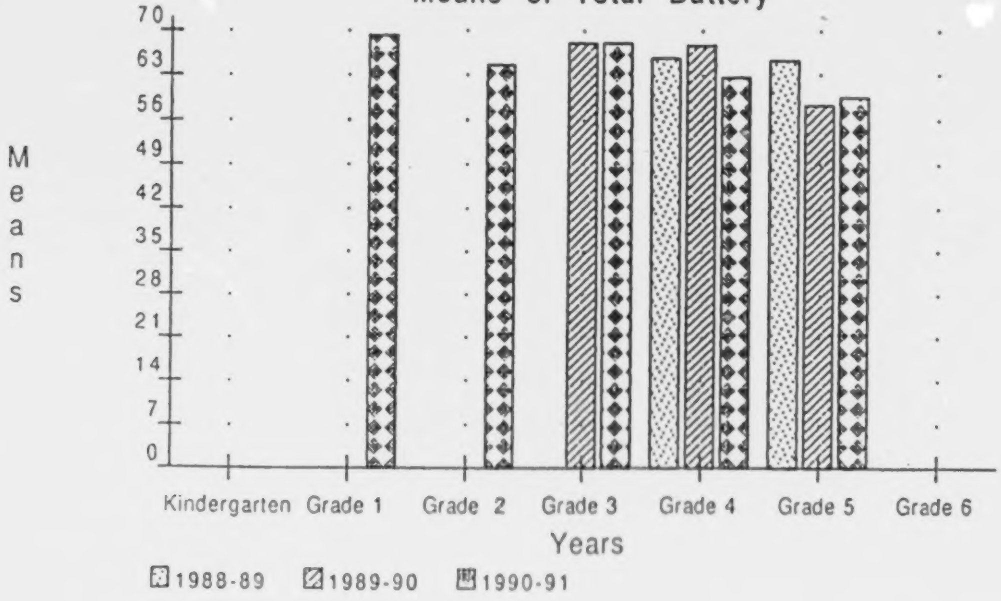

Table A-6

Means of Students by School and Year

Cognitive Skills Index

Grade	Years	School F	School H	School M	School W	Total	Analysis of Variance Source	F	Sign.
K (n=141)									
1 (n=180)									
2 (n=149)	90-91	109.0	108.6	104.2	100.5	106.1	Schools	2.36	0.07 n.s.
								1.43	
3 (n=195)									
4 (n=180)	88-89	107.7	103.6	115.9	107.7	109.9	Schools	5.91	.001
	89-90	112.2	106.2	118.9	110.8	113.3	Year	8.71	.0001
	90-91	110.0	110.6	118.3	108.4	112.2	SxY	1.32	.25 n.s.
5 (n=207)	88-89	112.1	105.6	109.9	113.2	110.1	Schools	3.28	.02
	89-90	108.9	103.8	110.3	108.9	107.7	Year	7.5	.001
	90-91	111.4	102.6	108.0	109.8	107.8	SxY	1.90	.08 n.s.

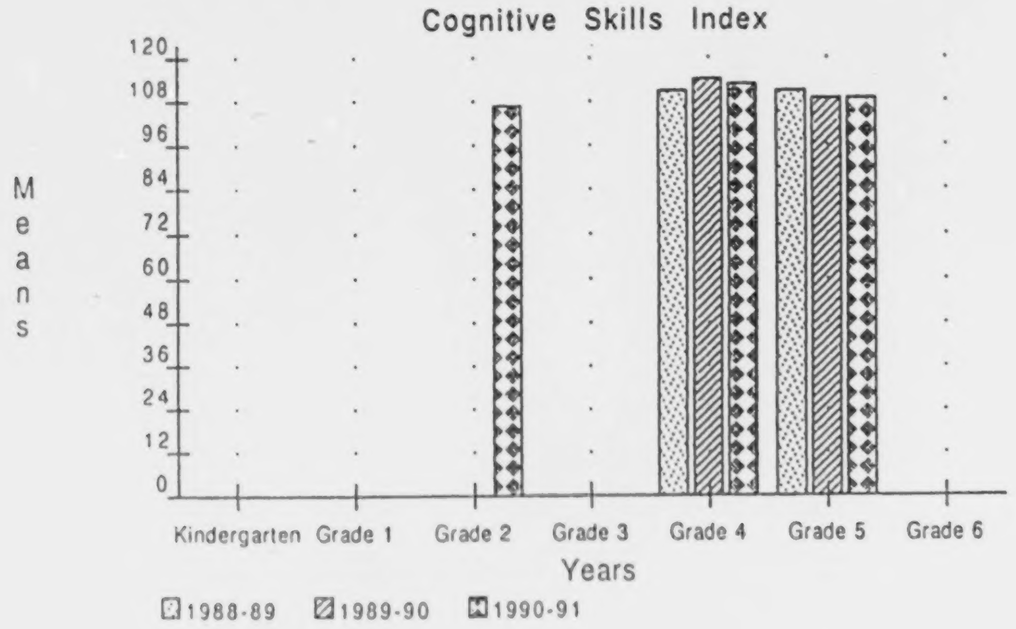

Table A-7
Means of Students by School and Year
About Me (Self Concept)

		School					Analysis of Variance		
Grade	Years	F	H	M	W	Total	Source	F	Sign.
K (n=141)									
1	89-90	24.4	21.7	23.5	21.4	22.8	Schools	5.05	.002
(n=140)	90-91	24.5	21.9	25.4	22.3	23.6	Year	1.77	.185 n.s.
							SxY	.57	.633 n.s.
2	89-90	25.5	23.1	23.0	23.4	23.7	Schools	1.39	.248 n.s.
(n=159)	90-91	26.9	24.7	26.6	26.9	26.4	Year	25.24	.0001
							SxY	1.43	.238 n.s.
3	89-90	24.2	26.3	24.8	25.7	25.3	Schools	1.39	.248 n.s.
(n=192)	90-91	27.0	27.5	25.1	27.6	26.9	Year	25.24	.0001
							SxY	1.43	.238 n.s.
4	89-90	27.6	27.5	25.9	26.1	26.6	Schools	2.13	0.01n.s.
(n=189)	90-91	25.8	21.4	26.1	28.2	26.2	Year	9.51	.002
							SxY	12.25	.0001n.s.
5	89-90	25.0	27.9	27.3	25.3	26.4	Schools	2.45	.065 n.s.
(n=204)	90-91	26.5	27.2	27.5	26.3	26.8	Year	2.14	0.145 n.s.
							SxY	2.10	0.10 n.s.

Means of Self Concept

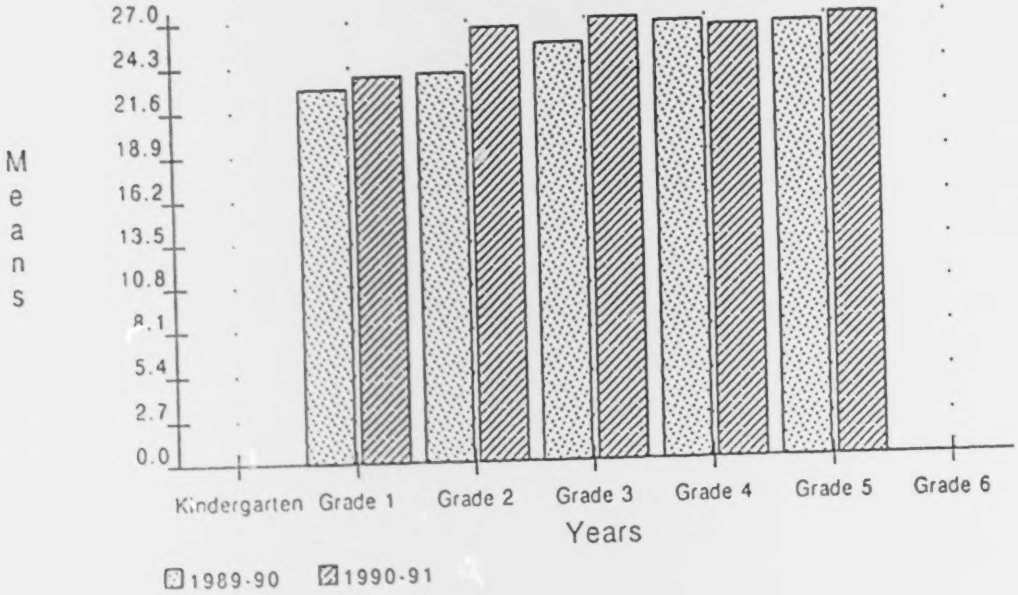

Table A-8
Means of Students by School and Year
About My School

		School					Analysis. of Variance		
Grade	Years	F	H	M	W	Total	Source	F	Sign.
K (n=141)									
1	89-90	13.0	11.4	12.6	11.5	12.1	Schools	3.46	.018
(n=140)	90-91	13.0	11.7	14.5	12.7	13.1	Year	3.58	.061 n.s.
							SxY	.95	.421 n.s.
2	89-90	14.5	13.6	14.6	13.3	14.0	Schools	1.10	.353 n.s.
(n=157)	90-91	16.9	15.6	16.8	15.8	16.3	Year	30.71	.0001
							SxY	.05	.984 n.s.
3	89-90	17.3	16.4	17.4	18.1	17.4	Schools	2.39	.07 n.s.
(n=192)	90-91	19.9	17.9	17.5	20.1	19.1	Year	19.02	.0001
							SxY	2.15	.095 n.s.
4	89-90	20.1	18.3	17.5	16.4	18.0	Schools	1.40	0.25 n.s.
(n=189)	90-91	18.3	19.7	18.5	19.5	18.9	Year	8.66	.004
							SxY	16.71	.0001
5	89-90	20.4	17.8	19.5	18.8	19.0	Schools	.14	0.93 n.s.
(n=204)	90-91	19.7	21.9	20.8	20.4	20.7	Year	15.4	.0001
							SxY	7.07	.0001

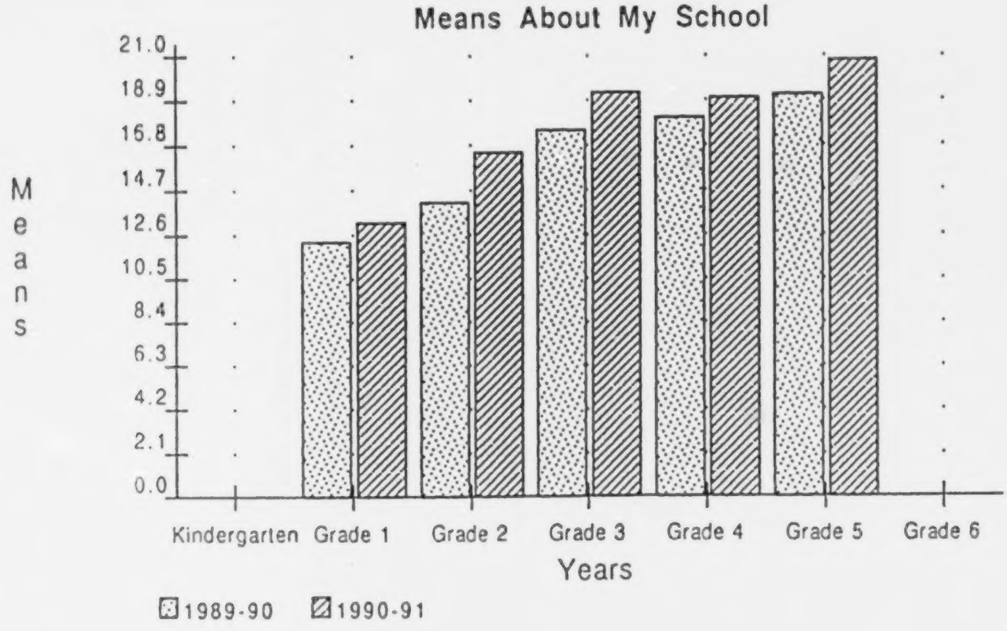

Table A-9
Means of Students by School and Year
About Computers

Grade	Years	F	H	M	W	Total	Source	F	Sign.
		School					Analysis. of Variance		
K (n=141)									
1	89-90	15.2	11.3	12.2	11.3	12.5	Schools	3.25	.024
(n=140)	90-91	13.5	12.8	13.3	12.1	12.9	Year	.40	.526 n.s.
							SxY	1.32	.271 n.s.
2	89-90	16.1	13.6	13.3	12.5	13.8	Schools	12.18	.0001
(n=155)	90-91	18.5	15.1	14.1	13.8	15.2	Year	14.37	.0001
							SxY	.62	.60 n.s.
3	89-90	15.3	14.4	14.2	14.4	14.6	Schools	1.56	.199 n.s.
(n=192)	90-91	17.5	16.5	15.7	15.7	16.4	Year	30.45	.0001
							SxY	.52	.60 n.s.
4	89-90	13.7	17.1	15.6	14.1	14.7	Schools	12.69	.0001
(n=189)	90-91	14.3	20.8	17.2	16.1	16.4	Year	33.8	.0001
							SxY	2.88	0.04
5	89-90	15.8	14.4	17.4	13.8	15.2	Schools	7.4	.0001
(n=204)	90-91	16.5	15.2	19.3	16.3	16.5	Year	21.6	.0001
							SxY	2.27	0.08 n.s.

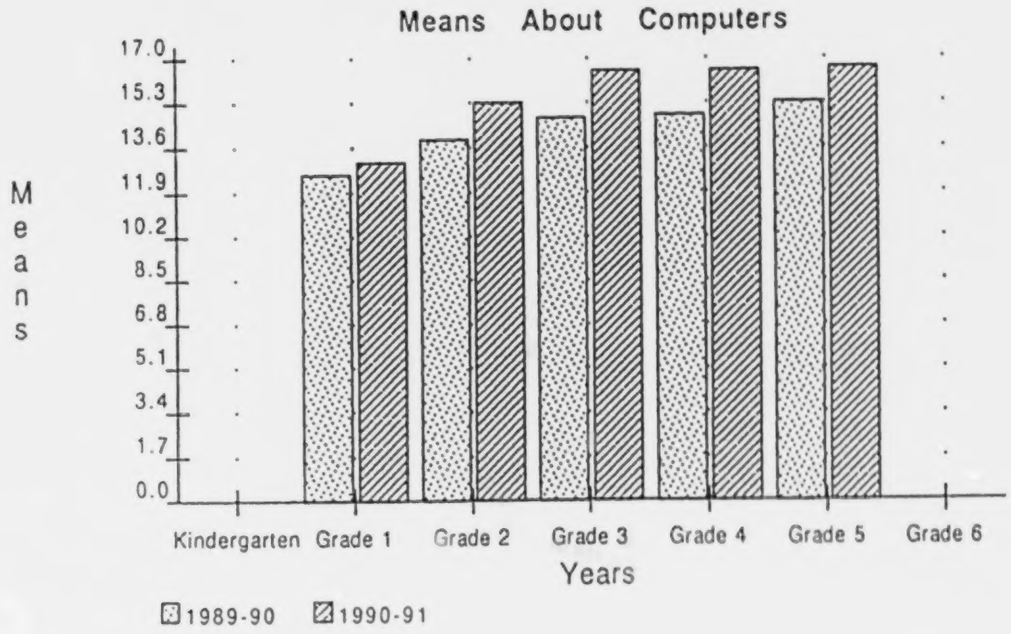

Table A-10

Means of Students by School and Year

What I Can Do With Computers

Grade	Years	School F	School H	School M	School W	Total	Analysis of Variance Source	F	Sign.
K (n=141)									
1	89-90	22.8	17.9	19.3	22.3	12.5	Schools	15.15	.0001
(n=140)	90-91	25.5	17.5	18.4	16.2	12.9	Year	3.26	.073 n.s.
							SxY	9.15	.0001
2	89-90	17.6	18.3	19.2	18.4	18.4	Schools	1.43	.236 n.s.
(n=155)	90-91	17.1	17.4	18.2	16.8	17.3	Year	3.26	.073 n.s.
							SxY	9.15	.0001.
3	89-90	17.9	19.1	20.8	19.0	19.1	Schools	3.92	.010
(n=192)	90-91	17.1	18.7	19.8	17.6	18.1	Year	7.03	.009
							SxY	.33	.803 n.s.
4	89-90	20.4	17.6	18.8	19.0	19.1	Schools	3.38	.02
(n=189)	90-91	16.2	14.7	16.8	17.6	18.1	Year	42.8	.0001
							SxY	4.48	.005
5	89-90	19.2	17.5	18.2	18.1	18.2	Schools	2.63	.05
(n=204)	90-91	16.7	15.9	18.3	17.1	16.9	Year	13.6	.0001
							SxY	2.22	0.09 n.s.

Means of What I Can Do With Computers

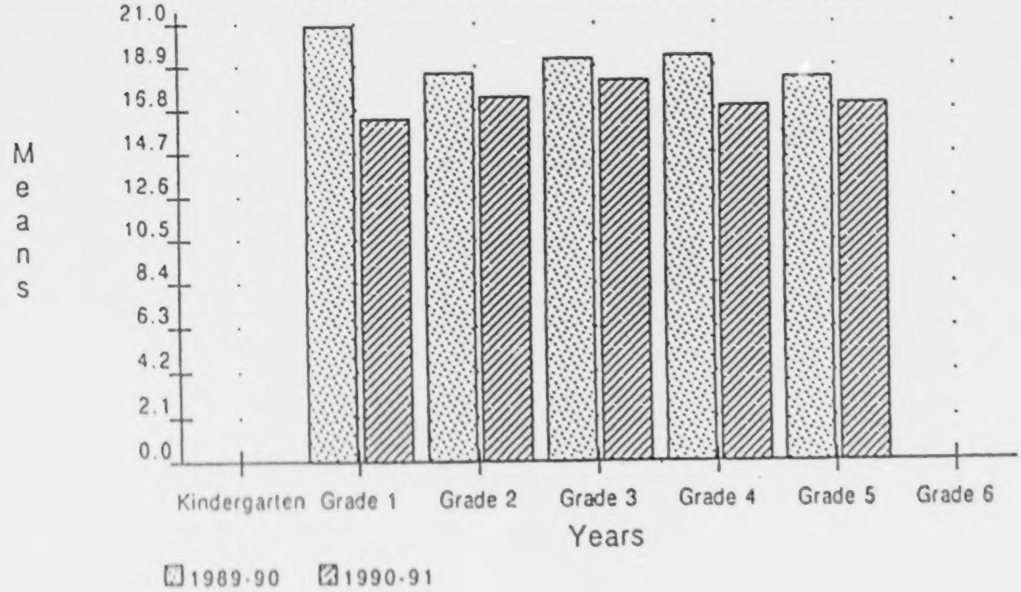

Table A-11
Means of Students by School and Year
Total Attitude

Grade	Years	School F	 H	 M	 W	 Total	Analysis. of Variance Source	 F	 Sign.
K (n=141)									
1	89-90	73.7	62.0	67.7	66.5	67.7	Schools	9.68	.0001
(n=140)	90-91	76.2	63.9	71.6	63.3	68.7	Year	.67	.413 n.s.
							SxY	1.17	.332 n.s.
2	89-90	73.8	68.5	70.3	65.4	69.3	Schools	5.98	.001
(n=155)	90-91	79.4	72.6	75.7	69.7	74.2	Year	14.60	.0001
							SxY	.10	.962 n.s.
3	89-90	74.5	76.3	77.5	77.3	76.3	Schools	.09	.963 n.s.
(n=192)	90-91	81.5	80.6	78.1	80.9	80.5	Year	17.75	.0001
							SxY	1.87	.135 n.s.
4	89-90	81.9	80.4	77.7	75.5	78.5	Schools	3.35	.02
(n=189)	90-91	74.6	76.7	78.8	81.7	78.3	Year	1.01	.315 n.s.
							SxY	14.65	.001
5	89-90	80.4	77.8	82.4	76.1	78.8	Schools	3.04	0.03
(n=204)	90-91	78.8	79.3	86.4	80.1	80.7	Year	4.87	.03
							SxY	2.22	.09 n.s.

Means of Total Attitude

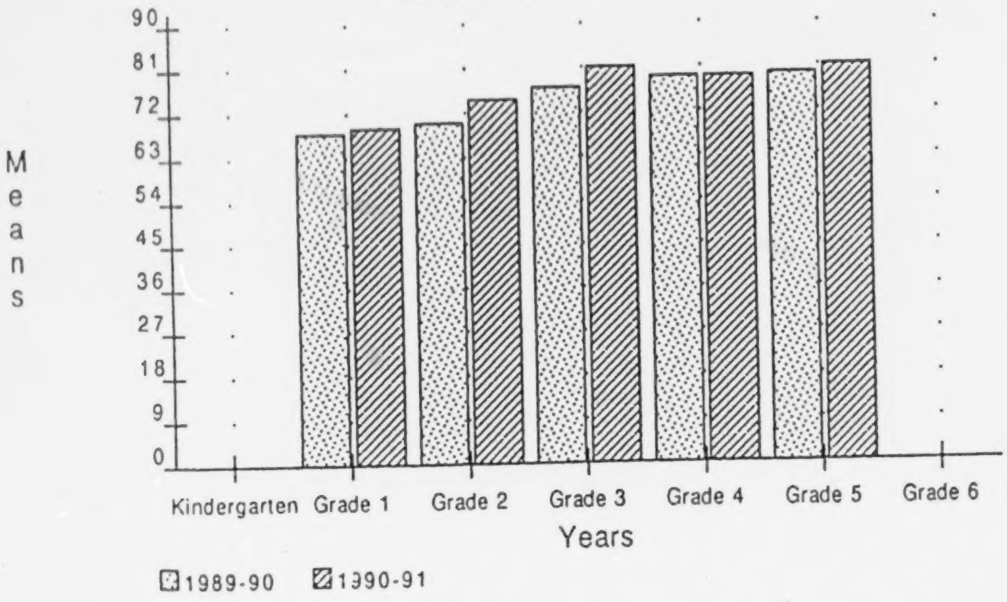

Table A-1

Means of Students by School and Year

Absences

Grade	Years	F	H	M	W	Total	Source	F	Sign.
K (n=141)	90-91	7.9	6.0	- -	9.0	7.7	Schools	1.54	0.22 n.s.
1 (n=154)	89-90	6.7	7.1	6.6	10.9	7.9	Schools	2.16	0.95 n.s.
	90-91	6.5	7.9	7.0	7.5	7.2	Year	1.35	2.47 n.s.
							SxY	4.12	.008
2 (n=161)	88-89	7.3	8.7	9.5	6.7	8.0	Schools	.04	.991 n.s.
	89-90	6.9	6.0	6.1	8.4	6.9	Year	7.28	.001
	90-91	6.0	5.5	4.9	4.3	5.2	SxY	1.57	.156 n.s.
3 (n=200)	88-89	7.5	6.0	6.9	5.8	6.5	Schools	.62	.604 n.s.
	89-90	6.2	5.7	5.7	7.4	6.3	Year	7.28	.001
	90-91	6.9	5.5	4.7	5.2	5.7	SxY	2.02	.06 n.s.
4 (n=186)	88-89	9.0	7.7	7.8	6.4	7.7	Schools	.60	0.62 n.s.
	89-90	6.0	5.8	5.6	6.3	6.0	Year	2.62	.07 n.s.
	90-91	5.4	6.4	3.6	5.5	5.0	SxY	2.65	.03
5 (n=207)	88-89	6.5	5.9	7.5	6.6	6.5	Schools	1.04	.378 n.s.
	89-90	7.1	4.8	6.5	6.6	6.2	Year	5.01	.007
	90-91	7.1	5.1	4.5	5.2	5.5	SxY	2.37	.03

Means of Absences

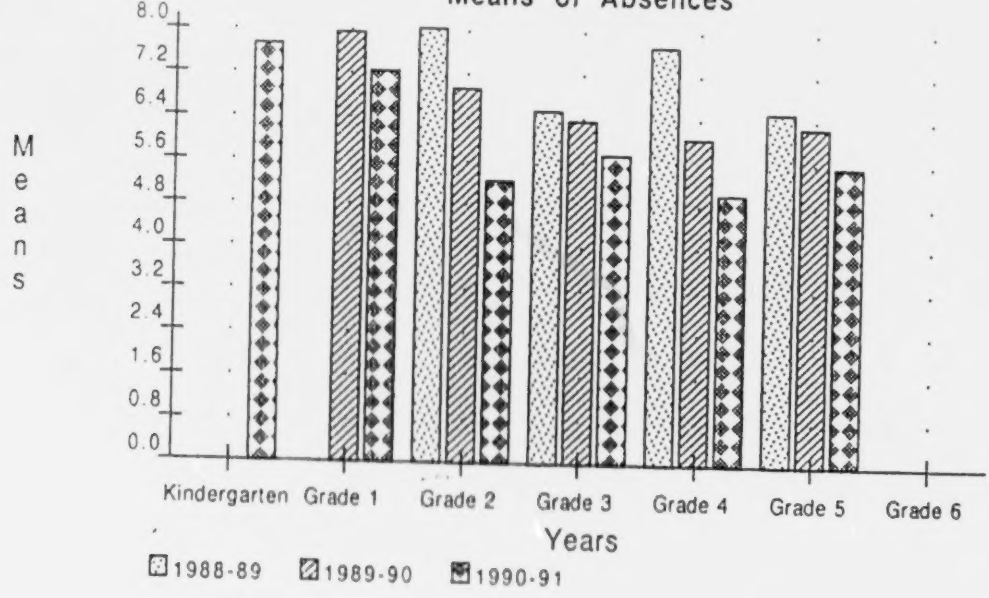

Table A-2
Means of Students by School and Year
Reading

Grade	Years	School					Analysis. of Variance		
		F	H	M	W	Total	Source	F	Sign.
K (n=141)									
1 (n=156)	90-91	69.8	62.5	59.9	55.7	61.5	Schools	2.87	0.38 n.s.
2 (n=162)	89-90	58.6	72.7	62.0	62.3	63.3	Schools	.86	.464 n.s.
	90-91	60.9	59.3	60.2	63.5	61.1	Year	4.66	.032
							SxY	6.06	.001
3 (n=195)	88-89	66.1	67.4	61.6	61.2	64.1	Schools	2.11	.100 n.s.
	89-90	65.1	59.6	59.1	57.2	60.3	Year	12.37	.0001
	90-91	71.3	65.0	57.1	68.1	66.0	SxY	4.83	.0001
4 (n=184)	88-89	58.5	61.0	66.3	56.2	60.4	Schools	3.88	.01
	89-90	58.8	60.3	67.4	60.3	62.0	Year	6.71	.002
	90-91	56.3	59.2	64.1	53.7	58.2	SxY	.99	0.44 n.s.
5 (n=207)	88-89	62.4	54.8	60.0	62.7	59.8	Schools	4.07	.008
	89-90	60.1	51.8	59.4	58.1	57.1	Year	14.1	.0001
	90-91	64.2	48.1	56.8	56.1	56.1	SxY	5.45	.0001

Means of Reading

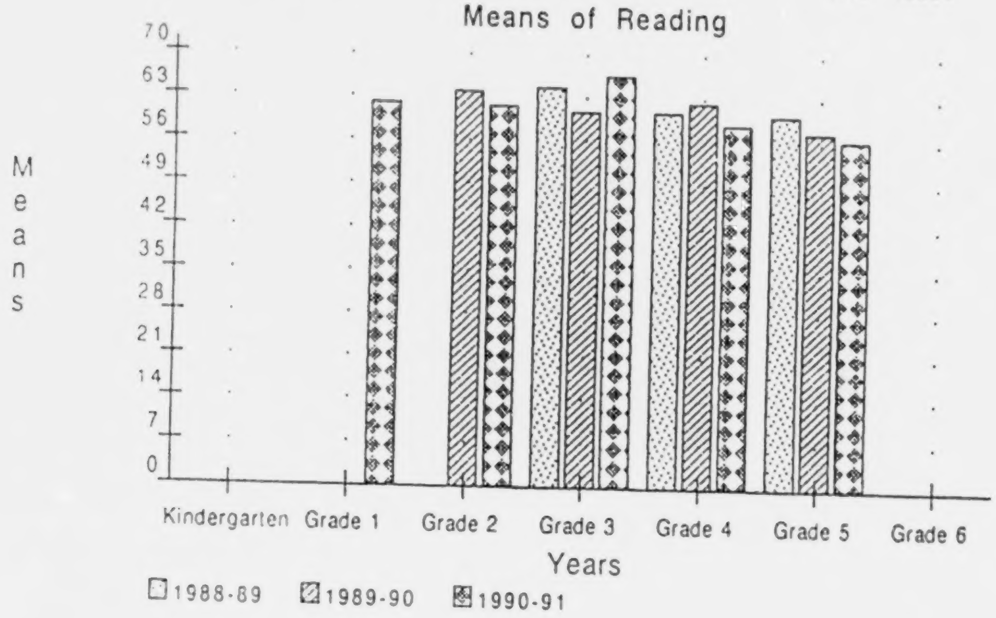

Table A-3
Means of Students by School and Year
Language

Grade	Years	School				Total	Analysis. of Variance		
		F	H	M	W		Source	F	Sign.
K (n=141)									
1 (n=156)	90-91	76.1	66.1	68.7	58.9	67.2	Schools	5.12	.002
2 (n=188)	90-91	60.9	64.4	66.0	65.2	64.2	Schools	.52	.067 n.s.
3 (n=195)	88-89			62.9			Schools	4.09	.008
	89-90	74.3	65.0	67.6	63.8	67.6	Year	1.41	n.s.
	90-91	77.7	68.5	66.9	63.9	69.2	SxY	2.42	.05
4 (n=184)	88-89	63.8	68.4	72.7	58.5	65.4	Schools	4.04	.008
	89-90	65.0	66.0	72.4	64.6	67.2	Year	7.24	.001
	90-91	60.9	61.8	68.0	59.7	62.8	SxY	1.42	0.20 n.s.
5 (n=207)	88-89	74.2	63.4	68.5	73.2	69.7	Schools	4.52	.004
	89-90	60.3	53.3	58.5	56.3	56.9	Year	88.5	.0001
	90-91	72.5	55.5	58.1	57.9	61.0	SxY	6.71	.0001

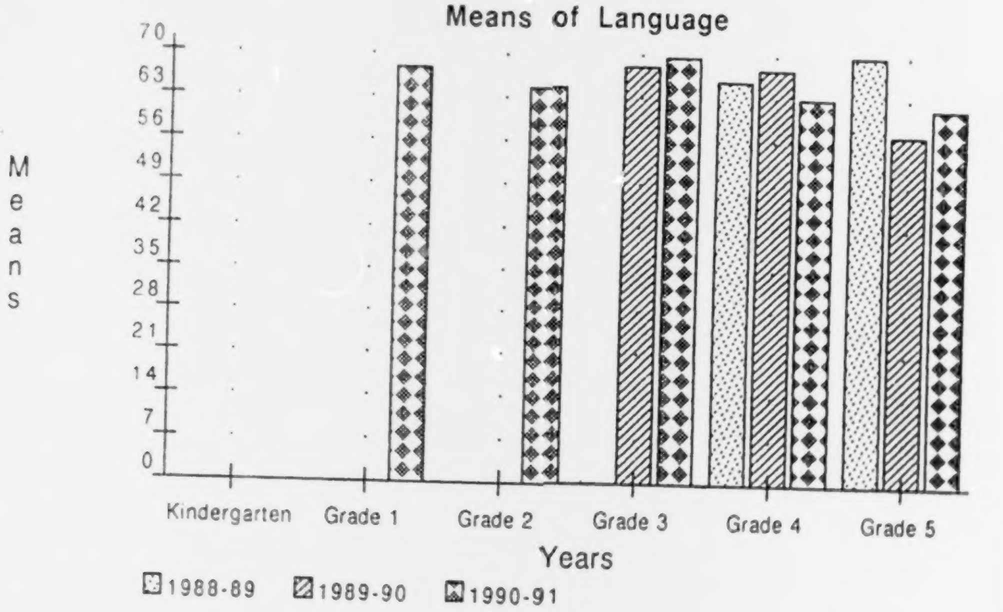

Table A-4
Means of Students by School and Year
Math

		School					Analysis. of Variance		
Grade	Years	F	H	M	W	Total	Source	F	Sign.
K (n=141)									
1 (n=157)	90-91	79.1	77.0	71.4	66.8	73.1	Schools	2.81	.042
2 (n=171)	89-90	76.0	80.7	80.4	75.4	77.9	Schools	1.59	.194 n.s.
	90-91	74.4	64.7	56.0	63.1	64.2	Year	102.36	.0001
							SxY	12.79	.0001
3 (n=195)	88-89	75.5	77.2	74.7	73.8	75.3	Schools	1.53	.208 n.s.
	89-90	68.5	69.4	60.4	64.9	66.1	Year	32.04	.0001
	90-91	72.2	68.1	68.9	61.1	67.3	SxY	12.79	.0001
4 (n=184)	88-89	63.3	65.6	73.1	59.5	65.4	Schools	4.04	.008
	89-90	63.4	72.2	66.6	67.2	67.2	Year	7.24	.001
	90-91	60.9	61.1	68.4	59.9	63.3	SxY	1.53	0.24 n.s.
5 (n=207)	88-89	66.8	58.1	67.3	65.9	64.2	Schools	3.09	.03
	89-90	61.2	53.5	65.6	60.1	59.7	Year	20.9	.0001
	90-91	65.3	54.4	56.9	59.3	59.0	SxY	4.43	.0001

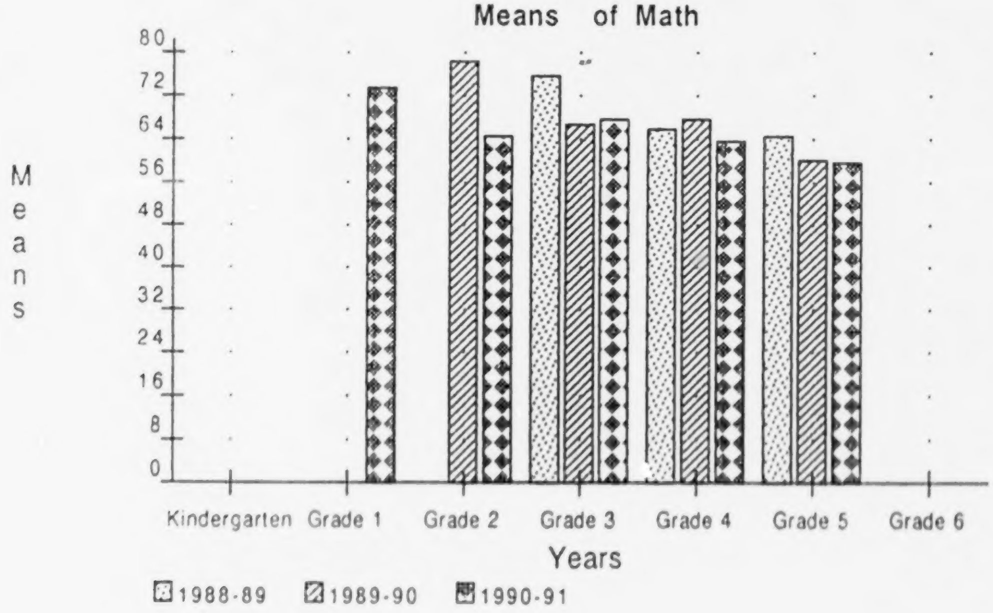

Table A-5
Means of Students by School and Year
Total Battery

Grade	Years	School					Analysis. of Variance		
		F	H	M	W	Total	Source	F	Sign.
K (n=141)									
1 (n=156)	90-91	77.2	70.4	68.3	61.6	69.0	Schools	3.69	0.01
2 (n=188)	90-91	67.9	63.6	60.2	64.5	64.0	Schools	1.08	0.36 n.s.
3	89-90	68.6	72.8	63.4	65.8	67.6	Schools	2.68	.05
(n=195)	90-91	71.9	67.5	64.5	64.8	67.5	Year	0.91	n.s.
							SxY	4.51	.002
4	88-89	63.3	65.6	73.1	59.5	65.4	Schools	3.94	.009
(n=184)	89-90	63.5	64.1	72.6	66.6	67.2	Year	15.1	.0001
	90-91	60.9	61.1	68.4	57.9	62.3	SxY	3.21	.004
5	88-89	67.1	58.7	66.5	67.9	64.8	Schools	3.60	0.01
(n=207)	89-90	60.9	52.6	61.4	58.6	58.1	Year	57.1	.0001
	90-91	68.5	53.1	58.2	57.9	59.3	SxY	9.05	.0001

Means of Total Battery

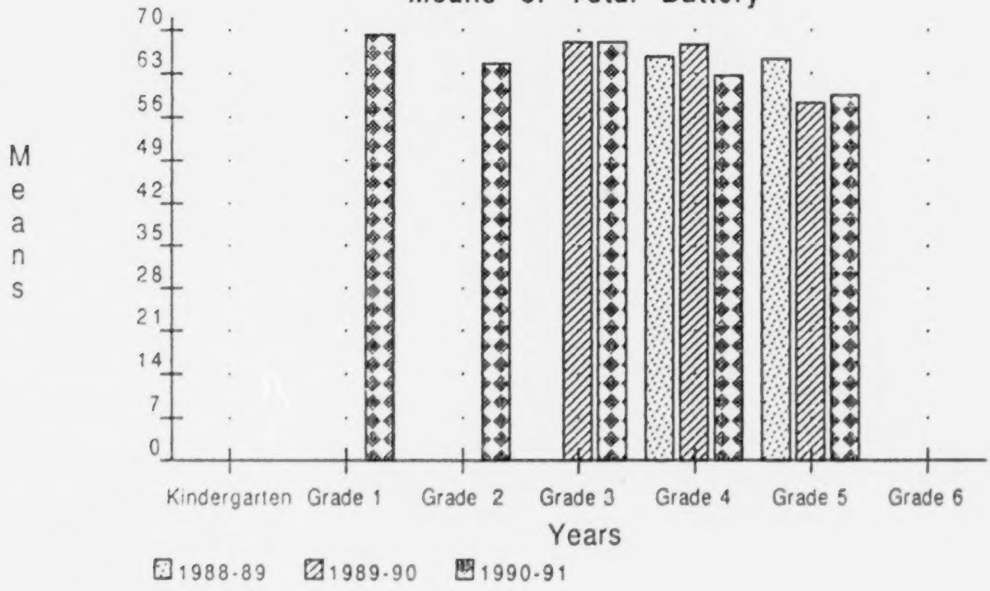

Table A-6
Means of Students by School and Year
Cognitive Skills Index

Grade	Years	School					Analysis. of Variance		
		F	H	M	W	Total	Source	F	Sign.
K (n=141)									
1 (n=180)									
2 (n=149)	90-91	109.0	108.6	104.2	100.5	106.1	Schools	2.36	0.07 n.s.
3 (n=195)									
4	88-89	107.7	103.6	115.9	107.7	109.9	Schools	5.91	.001
(n=180)	89-90	112.2	106.2	118.9	110.8	113.3	Year	8.71	.0001
	90-91	110.0	110.6	118.3	108.4	112.2	SxY	1.32	.25 n.s.
5	88-89	112.1	105.6	109.9	113.2	110.1	Schools	3.28	.02
(n=207)	89-90	108.9	103.8	110.3	108.9	107.7	Year	7.5	.001
	90-91	111.4	102.6	108.0	109.8	107.8	SxY	1.90	.08 n.s.

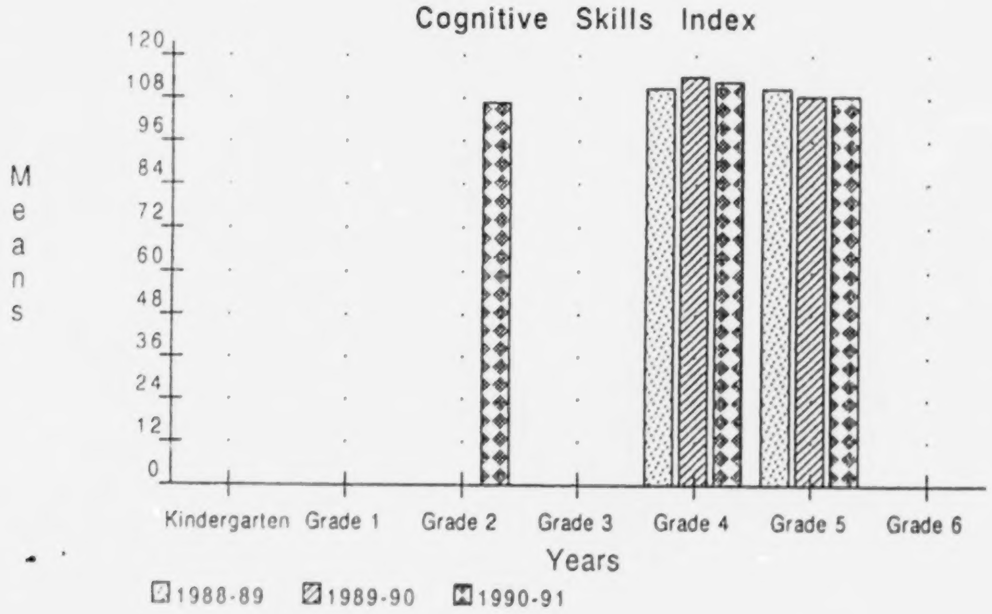
Cognitive Skills Index

Table A-7
Means of Students by School and Year
About Me (Self Concept)

		School					Analysis of Variance		
Grade	Years	F	H	M	W	Total	Source	F	Sign.
K (n=141)									
1	89-90	24.4	21.7	23.5	21.4	22.8	Schools	5.05	.002
(n=140)	90-91	24.5	21.9	25.4	22.3	23.6	Year	1.77	.185 n.s.
							SxY	.57	.633 n.s.
2	89-90	25.5	23.1	23.0	23.4	23.7	Schools	1.39	.248 n.s.
(n=159)	90-91	26.9	24.7	26.6	26.9	26.4	Year	25.24	.0001
							SxY	1.43	.238 n.s.
3	89-90	24.2	26.3	24.8	25.7	25.3	Schools	1.39	.248 n.s.
(n=192)	90-91	27.0	27.5	25.1	27.6	26.9	Year	25.24	.0001
							SxY	1.43	.238 n.s.
4	89-90	27.6	27.5	25.9	26.1	26.6	Schools	2.13	0.01n.s.
(n=189)	90-91	25.8	21.4	26.1	28.2	26.2	Year	9.51	.002
							SxY	12.25	.0001n.s.
5	89-90	25.0	27.9	27.3	25.3	26.4	Schools	2.45	.065 n.s.
(n=204)	90-91	26.5	27.2	27.5	26.3	26.8	Year	2.14	0.145 n.s.
							SxY	2.10	0.10 n.s.

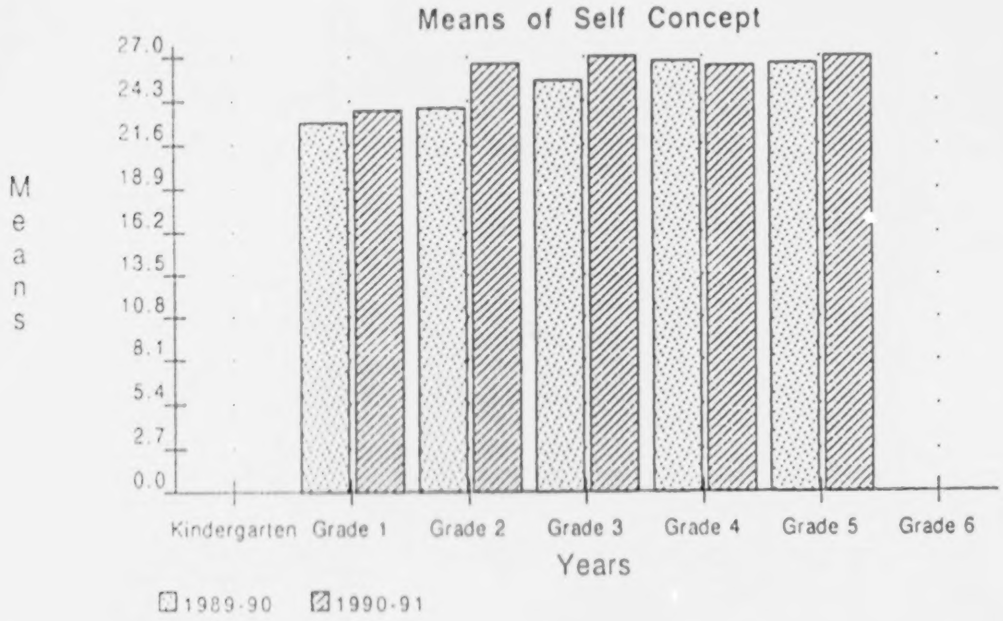

Table A-8
Means of Students by School and Year
About My School

Grade	Years	School F	 H	 M	 W	 Total	Analysis of Variance Source	 F	 Sign.
K (n=141)									
1 (n=140)	89-90	13.0	11.4	12.6	11.5	12.1	Schools	3.46	.018
	90-91	13.0	11.7	14.5	12.7	13.1	Year	3.58	.061 n.s.
							SxY	.95	.421 n.s.
2 (n=157)	89-90	14.5	13.6	14.6	13.3	14.0	Schools	1.10	.353 n.s.
	90-91	16.9	15.6	16.8	15.8	16.3	Year	30.71	.0001
							SxY	.05	.984 n.s.
3 (n=192)	89-90	17.3	16.4	17.4	18.1	17.4	Schools	2.39	.07 n.s.
	90-91	19.9	17.9	17.5	20.1	19.1	Year	19.02	.0001
							SxY	2.15	.095 n.s.
4 (n=189)	89-90	20.1	18.3	17.5	16.4	18.0	Schools	1.40	0.25 n.s.
	90-91	18.3	19.7	18.5	19.5	18.9	Year	8.66	.004
							SxY	16.71	.0001
5 (n=204)	89-90	20.4	17.8	19.5	18.8	19.0	Schools	.14	0.93 n.s.
	90-91	19.7	21.9	20.8	20.4	20.7	Year	15.4	.0001
							SxY	7.07	.0001

Means About My School

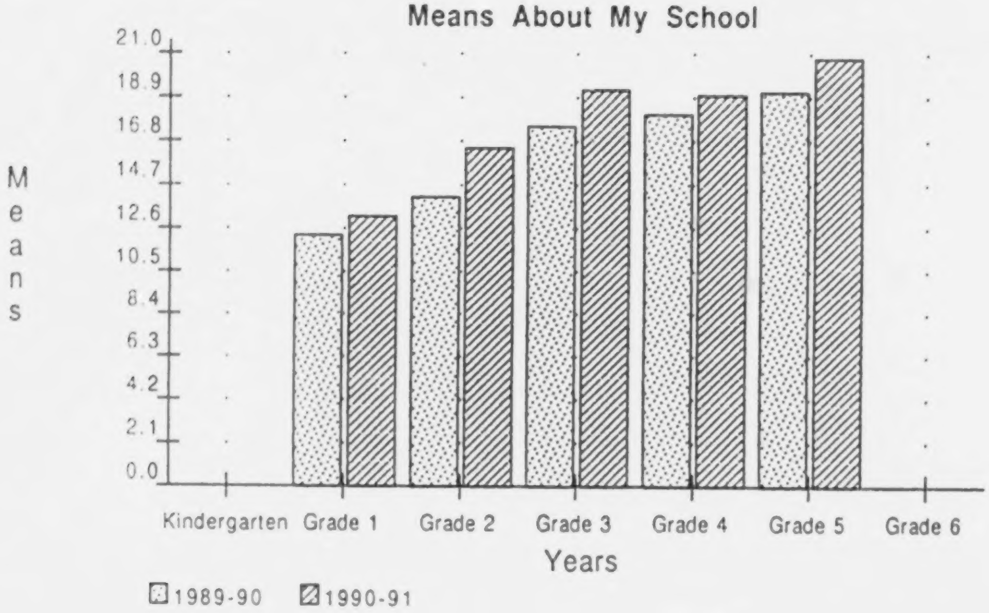

Table A-9
Means of Students by School and Year
About Computers

		School					Analysis of Variance		
Grade	Years	F	H	M	W	Total	Source	F	Sign.
K (n=141)									
1	89-90	15.2	11.3	12.2	11.3	12.5	Schools	3.25	.024
(n=140)	90-91	13.5	12.8	13.3	12.1	12.9	Year	.40	.526 n.s.
							SxY	1.32	.271 n.s.
2	89-90	16.1	13.6	13.3	12.5	13.8	Schools	12.18	.0001
(n=155)	90-91	18.5	15.1	14.1	13.8	15.2	Year	14.37	.0001
							SxY	.62	.60 n.s.
3	89-90	15.3	14.4	14.2	14.4	14.6	Schools	1.56	.199 n.s.
(n=192)	90-91	17.5	16.5	15.7	15.7	16.4	Year	30.45	.0001
							SxY	.52	.60 n.s.
4	89-90	13.7	17.1	15.6	14.1	14.7	Schools	12.69	.0001
(n=189)	90-91	14.3	20.8	17.2	16.1	16.4	Year	33.8	.0001
							SxY	2.88	0.04
5	89-90	15.8	14.4	17.4	13.8	15.2	Schools	7.4	.0001
(n=204)	90-91	16.5	15.2	19.3	16.3	16.5	Year	21.6	.0001
							SxY	2.27	0.08 n.s.

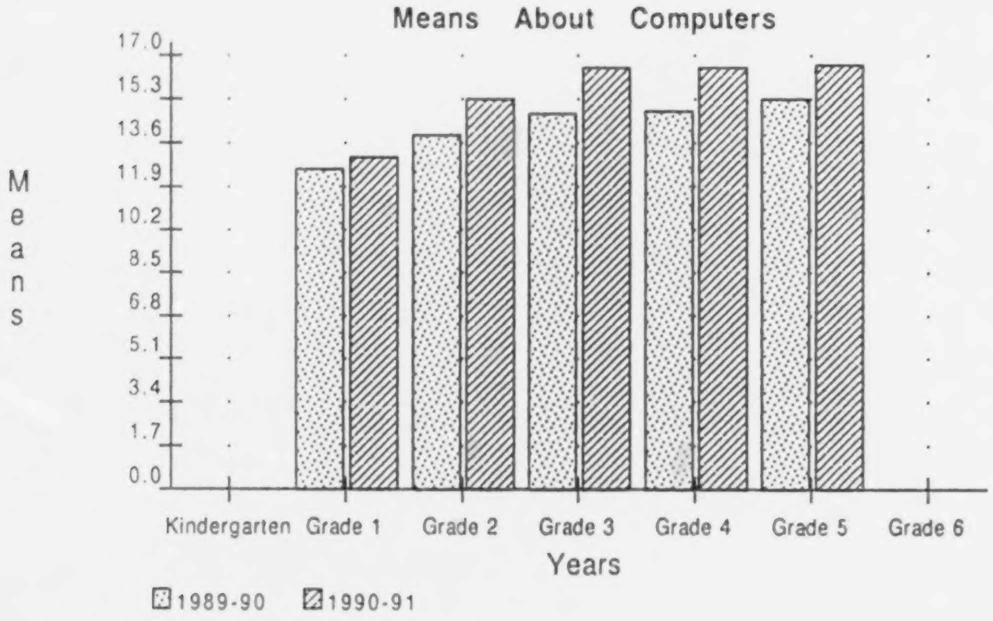
Means About Computers

Table A-10

Means of Students by School and Year

What I Can Do With Computers

Grade	Years	F	H	M	W	Total	Source	F	Sign.
		School					Analysis of Variance		
K (n=141)									
1	89-90	22.8	17.9	19.3	22.3	12.5	Schools	15.15	.0001
(n=140)	90-91	25.5	17.5	18.4	16.2	12.9	Year	3.26	.073 n.s.
							SxY	9.15	.0001
2	89-90	17.6	18.3	19.2	18.4	18.4	Schools	1.43	.236 n.s.
(n=155)	90-91	17.1	17.4	18.2	16.8	17.3	Year	3.26	.073 n.s.
							SxY	9.15	.0001.
3	89-90	17.9	19.1	20.8	19.0	19.1	Schools	3.92	.010
(n=192)	90-91	17.1	18.7	19.8	17.6	18.1	Year	7.03	.009
							SxY	.33	.803 n.s.
4	89-90	20.4	17.6	18.8	19.0	19.1	Schools	3.38	.02
(n=189)	90-91	16.2	14.7	16.8	17.6	18.1	Year	42.8	.0001
							SxY	4.48	.005
5	89-90	19.2	17.5	18.2	18.1	18.2	Schools	2.63	.05
(n=204)	90-91	16.7	15.9	18.3	17.1	16.9	Year	13.6	.0001
							SxY	2.22	0.09 n.s.

Means of What I Can Do With Computers

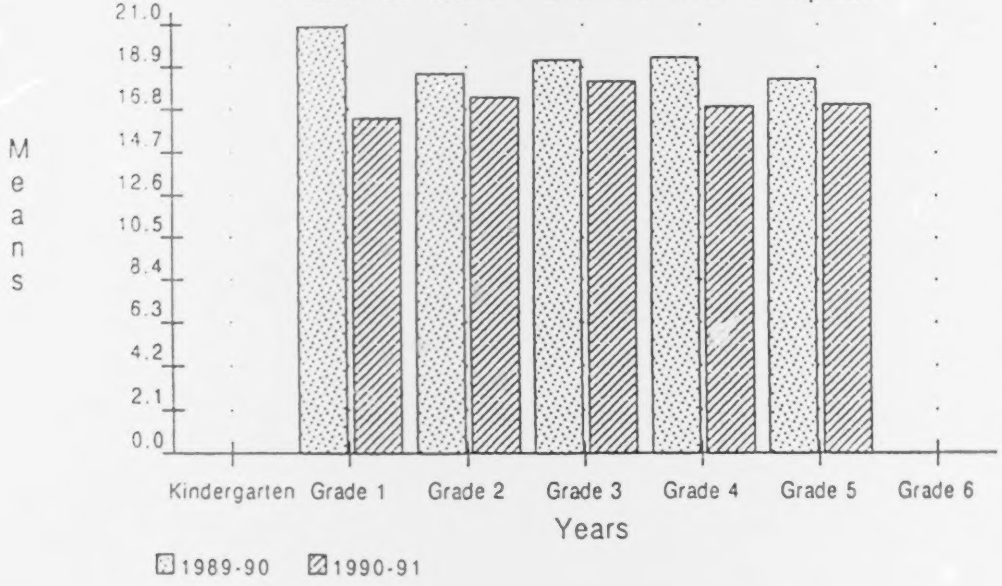

Table A-11
Means of Students by School and Year
Total Attitude

Grade	Years	School F	H	M	W	Total	Analysis. of Variance Source	F	Sign.
K (n=141)									
1	89-90	73.7	62.0	67.7	66.5	67.7	Schools	9.68	.0001
(n=140)	90-91	76.2	63.9	71.6	63.3	68.7	Year	.67	.413 n.s.
							SxY	1.17	.332 n.s.
2	89-90	73.8	68.5	70.3	65.4	69.3	Schools	5.98	.001
(n=155)	90-91	79.4	72.6	75.7	69.7	74.2	Year	14.60	.0001
							SxY	.10	.962 n.s.
3	89-90	74.5	76.3	77.5	77.3	76.3	Schools	.09	.963 n.s.
(n=192)	90-91	81.5	80.6	78.1	80.9	80.5	Year	17.75	.0001
							SxY	1.87	.135 n.s.
4	89-90	81.9	80.4	77.7	75.5	78.5	Schools	3.35	.02
(n=189)	90-91	74.6	76.7	78.8	81.7	78.3	Year	1.01	.315 n.s.
							SxY	14.65	.001
5	89-90	80.4	77.8	82.4	76.1	78.8	Schools	3.04	0.03
(n=204)	90-91	78.8	79.3	86.4	80.1	80.7	Year	4.87	.03
							SxY	2.22	.09 n.s.

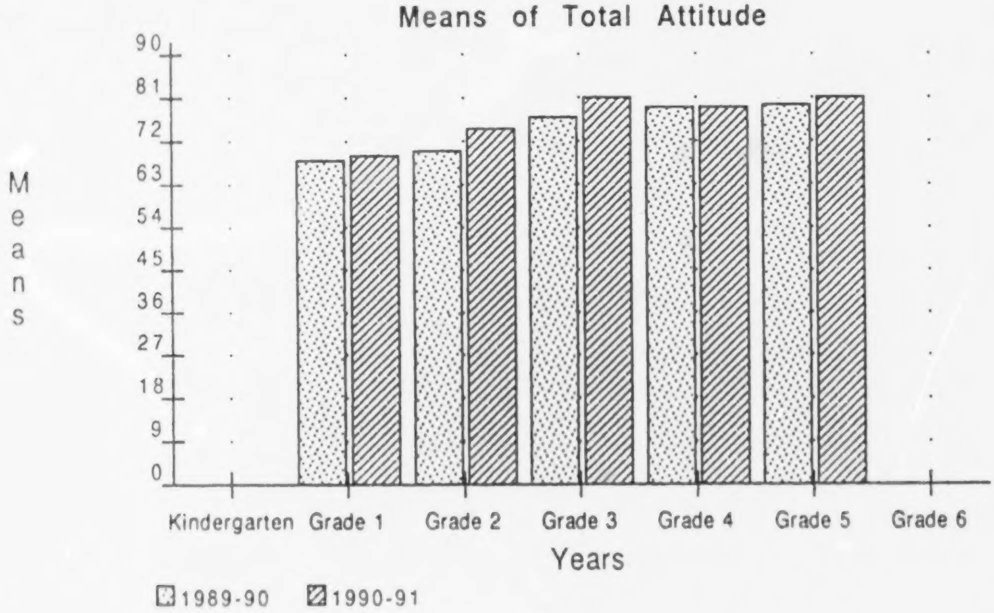

Table B-1
Gains or (Losses) In Successive Years by School District
Grade 1

Subject	Means			Significance	
	88-89	89-90	90-91	89 vs 91	90 vs 91
Reading	63.6	64.0	61.1	(.05)	(.01)
Math	75.9	78.2	71.1	(.01)	(.001)
Language Arts	64.7	64.5	65.7	n.s.	n.s.
Composite	N/A	N/A	N/A	—	—

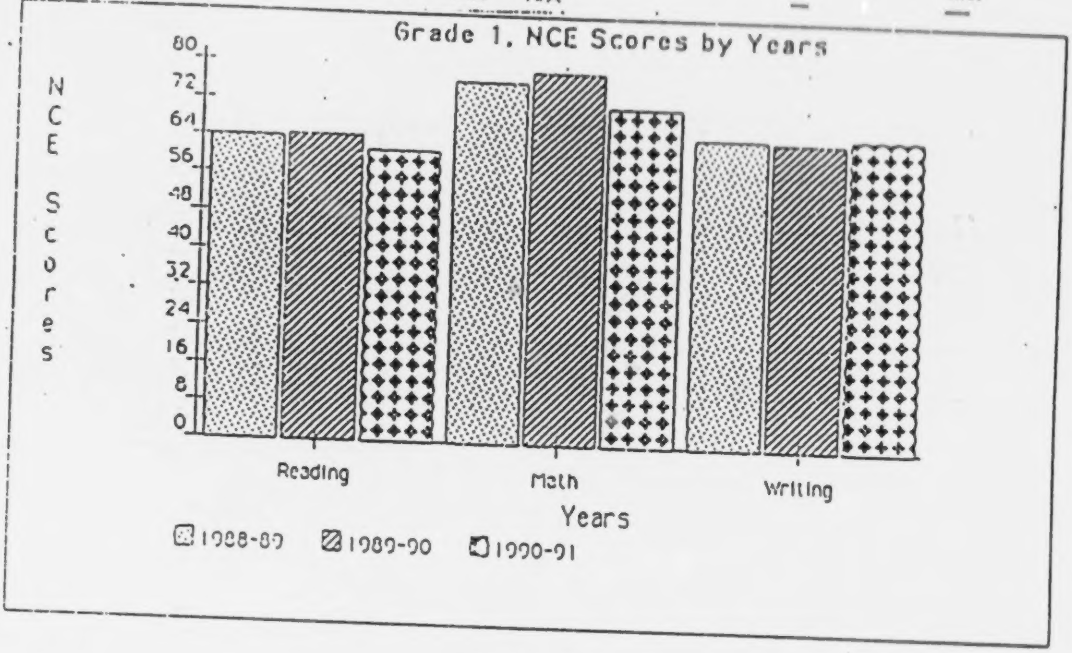

Table B-2
Gains or (Losses) In Successive Years by School District
Grade 2

Subject	Means			Significance	
	88-89	89-90	90-91	89 vs 91	90 vs 91
Reading	63.7	61.1	61.1	(.05)	n.s.
Math	66.7	66.4	62.8	(.01)	(.01)
Language Arts	69.0	68.4	64.4	(.001)	(.001)
Composite	68.4	66.7	63.7	(.0001)	(.001)

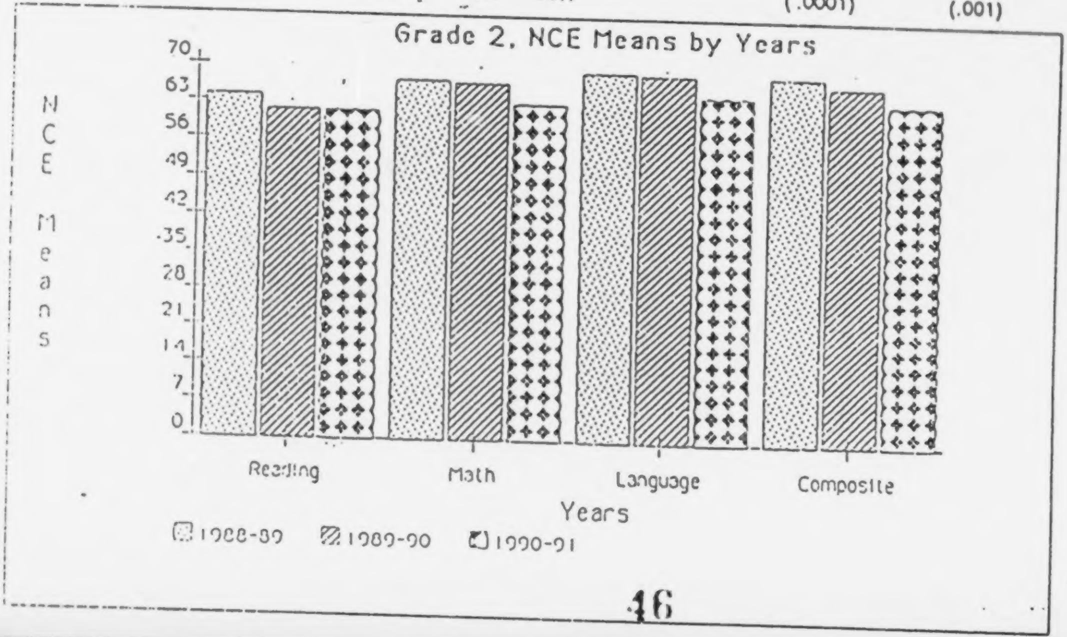

Table B-3
Gains or (Losses) In Successive Years by Class
Grade 3

Subject	Means			Significance	
	88-89	89-90	90-91	89 vs 91	90 vs 91
Reading	61.6	65.4	65.4	.01	n.s.
Math	66.6	70.1	65.9	n.s.	(.01)
Language Arts	71.4	72.9	68.0	(.05)	(.01)
Composite	67.5	70.7	67.7	(n.s.)	(.05)

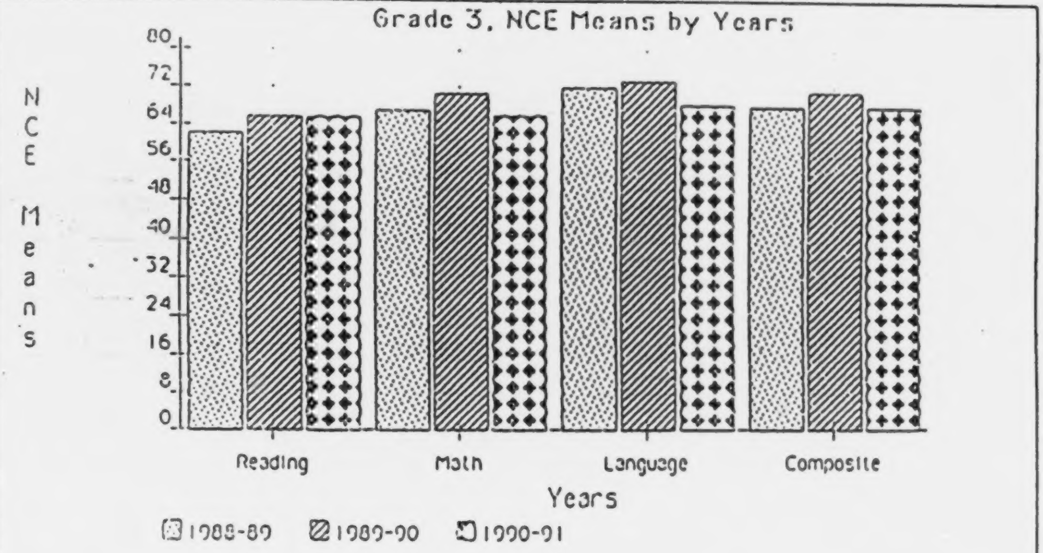

Table B-4
Gains or (Losses) In Successive Years by Class
Grade 4

Subject	Means			Significance	
	88-89	89-90	90-91	89 vs 91	90 vs 91
Reading	55.1	58.4	57.5	.05	n.s.
Math	56.2	61.5	62.0	.001	n.s.
Language Arts	52.7	58.2	61.8	.0001	.05
Science	54.4	58.7	58.7	.001	n.s.
Social Studies	54.4	56.2	59.8	.0001	.01
Composite	54.7	59.7	61.4	.0001	.001

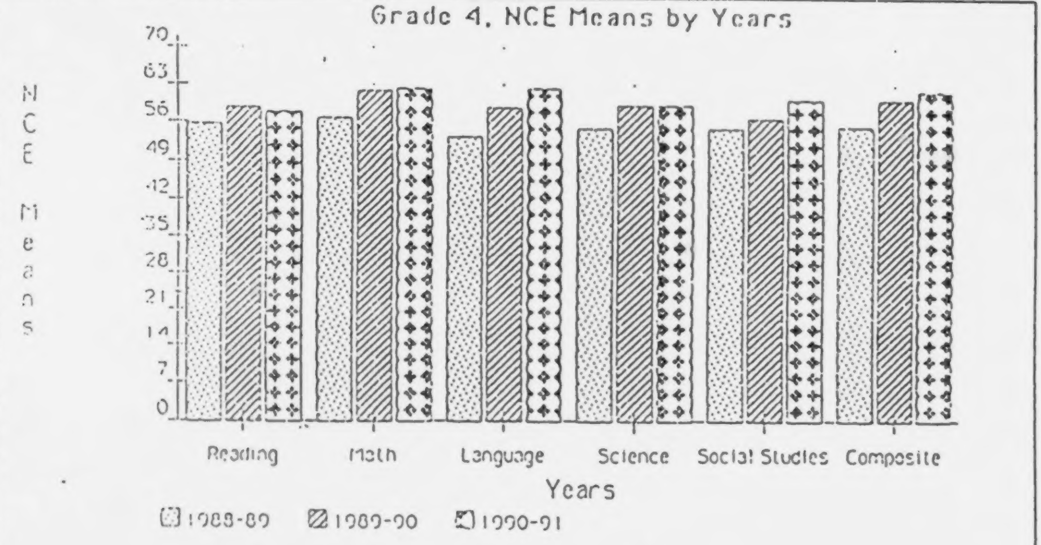

Table B-5

Gains or (Losses) In Successive Years by Class

Grade 5

Subject	Means 88-89	Means 89-90	Means 90-91	Significance 89 vs 91	Significance 90 vs 91
Reading	56.1	57.9	56.2	n.s.	(.05)
Math	54.1	61.4	58.4	.01	(.05)
Language Arts	56.7	56.9	60.7	.01	.01
Science	57.3	60.0	60.4	.01	n.s.
Social Studies	59.4	61.5	56.3	.05	.001
Composite	55.9	58.9	59.1	.05	n.s.

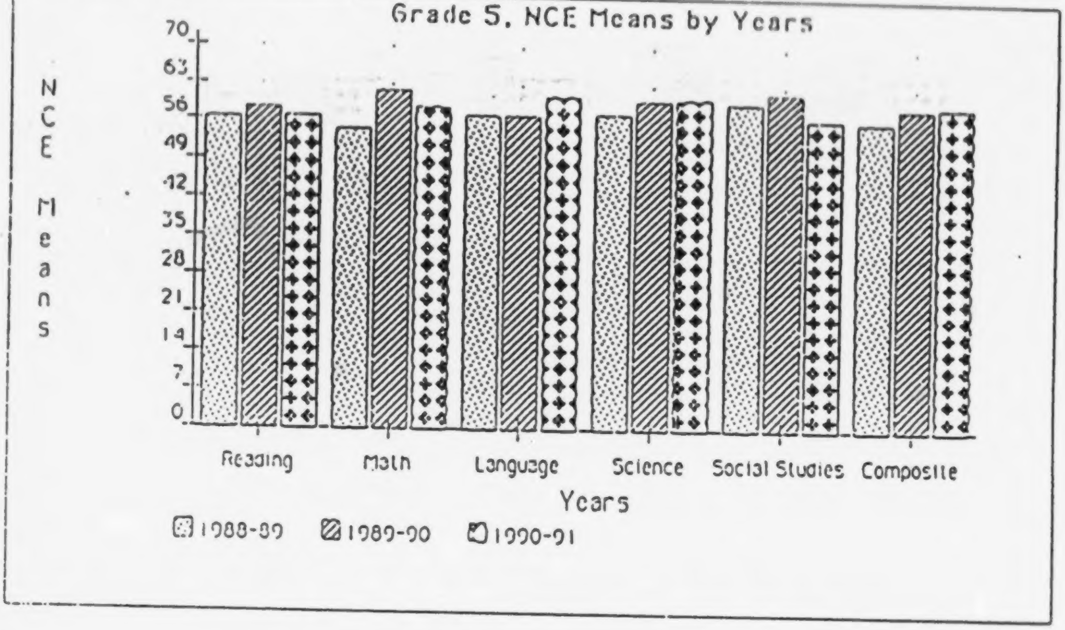

Table B-6

Gains or (Losses) In Successive Years by Class

Grade 6

Subject	Means 88-89	Means 89-90	Means 90-91	Significance 89 vs 91	Significance 90 vs 91
Reading	59.4	58.4	61.3	n.s.	.05
Math	56.8	57.9	62.4	001	.01
Language Arts	61.3	59.7	58.9	(.01)	n.s.
Composite	59.7	59.0	59.9	n.s.	n.s.

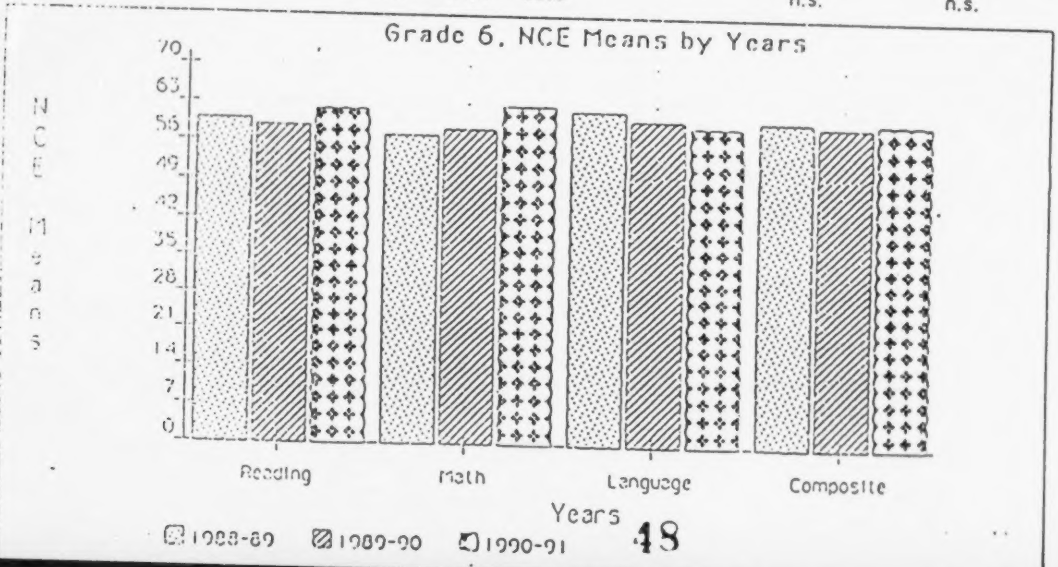

Table B-1

Gains or (Losses) in Successive Years by School District

Grade 1

Subject	Means 88-89	Means 89-90	Means 90-91	Significance 89 vs 91	Significance 90 vs 91
Reading	63.6	64.0	61.1	(.05)	(.01)
Math	75.9	78.2	71.1	(.01)	(.001)
Language Arts	64.7	64.5	65.7	n.s.	n.s.
Composite	N/A	N/A	N/A	—	—

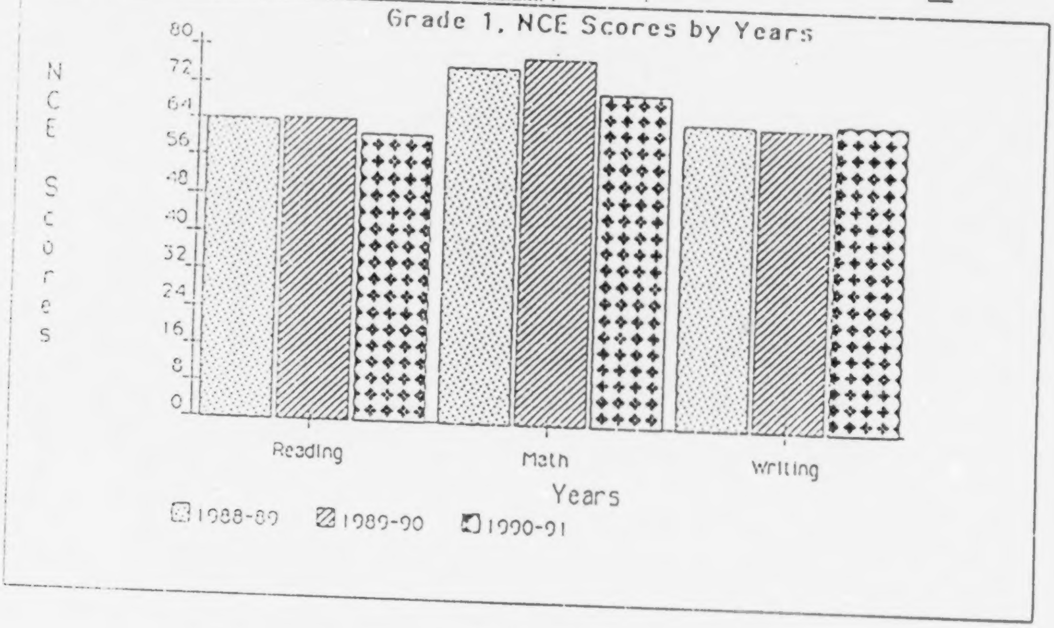

Table B-2

Gains or (Losses) in Successive Years by School District

Grade 2

Subject	Means 88-89	Means 89-90	Means 90-91	Significance 89 vs 91	Significance 90 vs 91
Reading	63.7	61.1	61.1	(.05)	n.s.
Math	66.7	66.4	62.8	(.01)	(.01)
Language Arts	69.0	68.4	64.4	(.001)	(.001)
Composite	68.4	66.7	63.7	(.0001)	(.001)

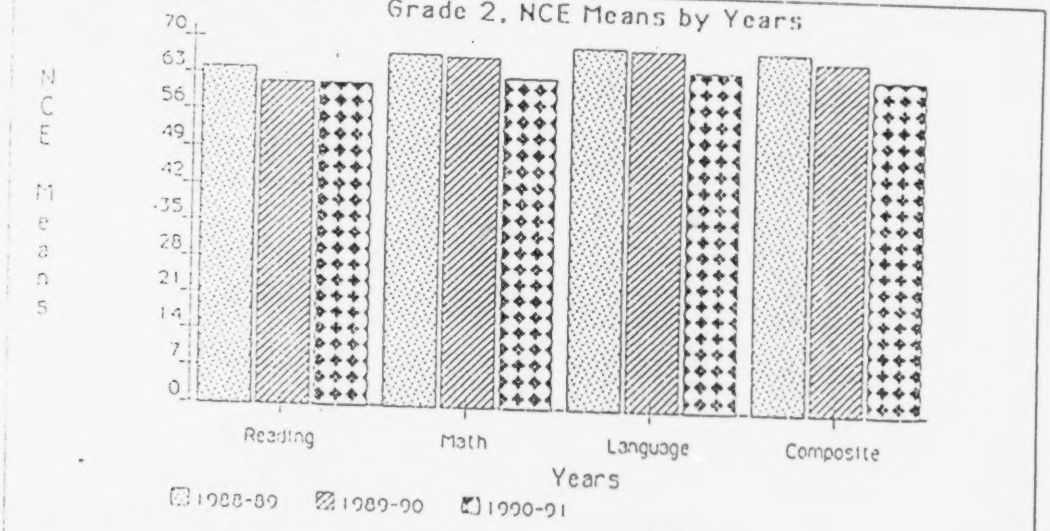

Table B-5
Gains or (Losses) In Successive Years by Class
Grade 5

Subject	Means			Significance	
	88-89	89-90	90-91	89 vs 91	90 vs 91
Reading	56.1	57.9	56.2	n.s.	(.05)
Math	54.1	61.4	58.4	.01	(.05)
Language Arts	56.7	56.9	60.7	.01	.01
Science	57.3	60.0	60.4	.01	n.s.
Social Studies	59.4	61.5	56.3	.05	.001
Composite	55.9	58.9	59.1	.05	n.s.

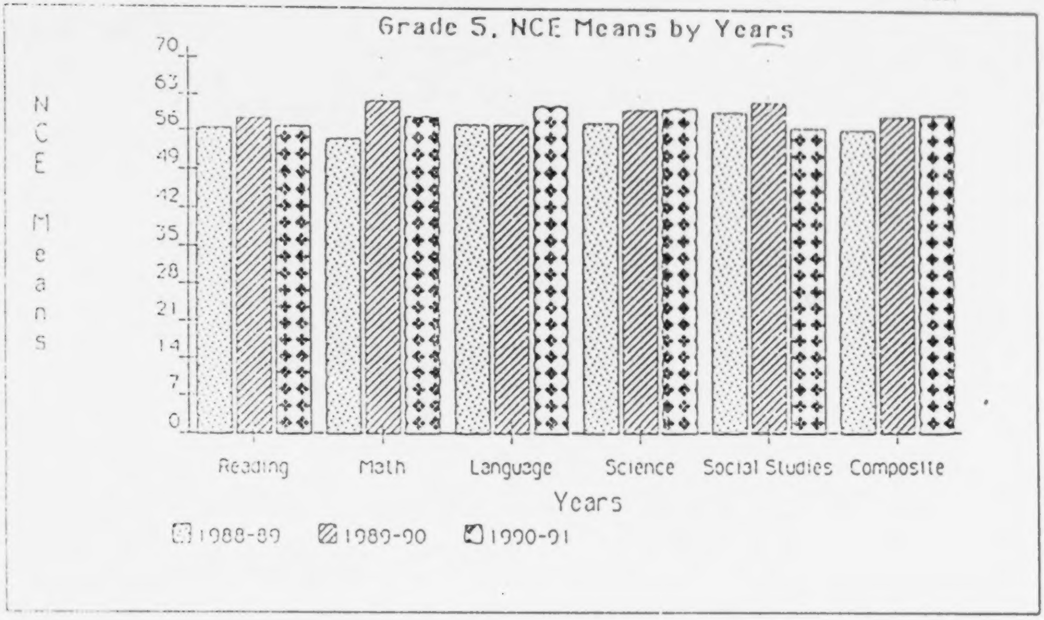

Table B-6
Gains or (Losses) In Successive Years by Class
Grade 6

Subject	Means			Significance	
	88-89	89-90	90-91	89 vs 91	90 vs 91
Reading	59.4	58.4	61.3	n.s.	.05
Math	56.8	57.9	62.4	001	.01
Language Arts	61.3	59.7	58.9	(.01)	n.s.
Composite	59.7	59.0	59.9	n.s.	n.s.

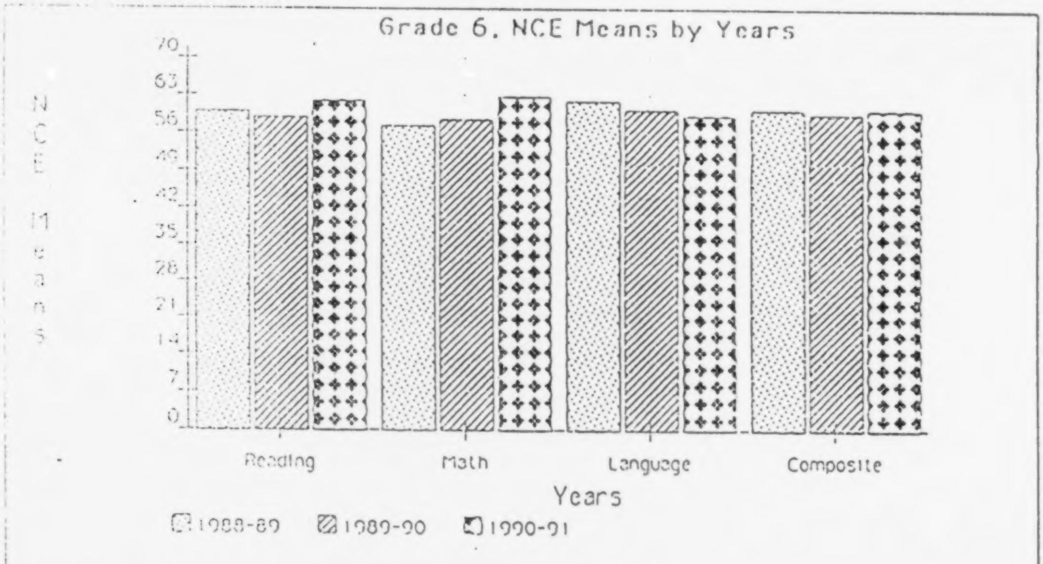

Table B-3
Gains or (Losses) In Successive Years by Class
Grade 3

Subject	Means			Significance	
	88-89	89-90	90-91	89 vs 91	90 vs 91
Reading	61.6	65.4	65.4	.01	n.s.
Math	66.6	70.1	65.9	n.s.	(.01)
Language Arts	71.4	72.9	68.0	(.05)	(.01)
Composite	67.5	70.7	67.7	(n.s.)	(.05)

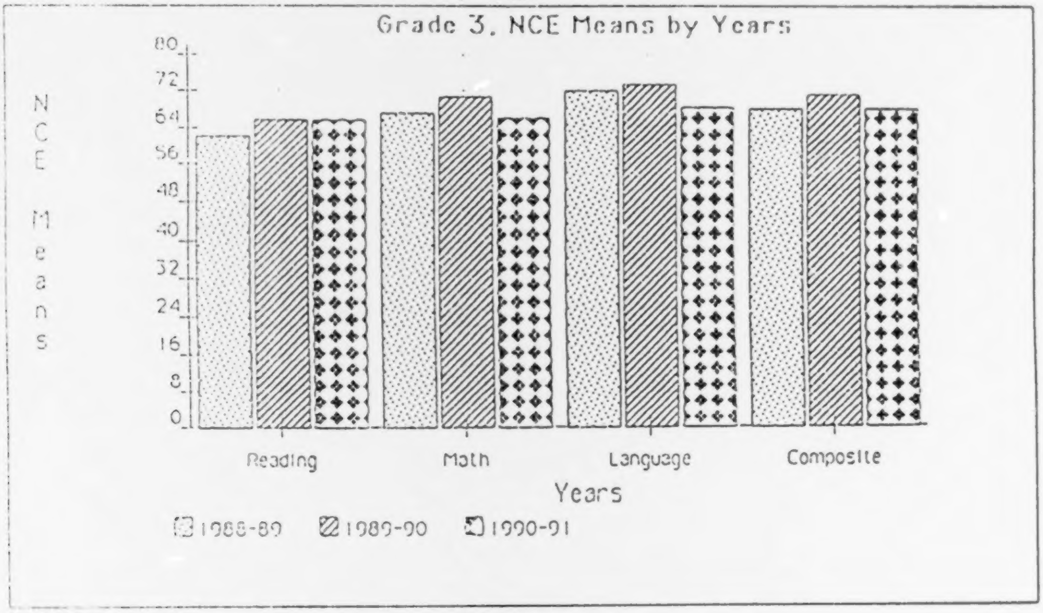

Table B-4
Gains or (Losses) In Successive Years by Class
Grade 4

Subject	Means			Significance	
	88-89	89-90	90-91	89 vs 91	90 vs 91
Reading	55.1	58.4	57.5	.05	n.s.
Math	56.2	61.5	62.0	.001	n.s.
Language Arts	52.7	58.2	61.8	.0001	.05
Science	54.4	58.7	58.7	.001	n.s.
Social Studies	54.4	56.2	59.8	.0001	.01
Composite	54.7	59.7	61.4	.0001	.001

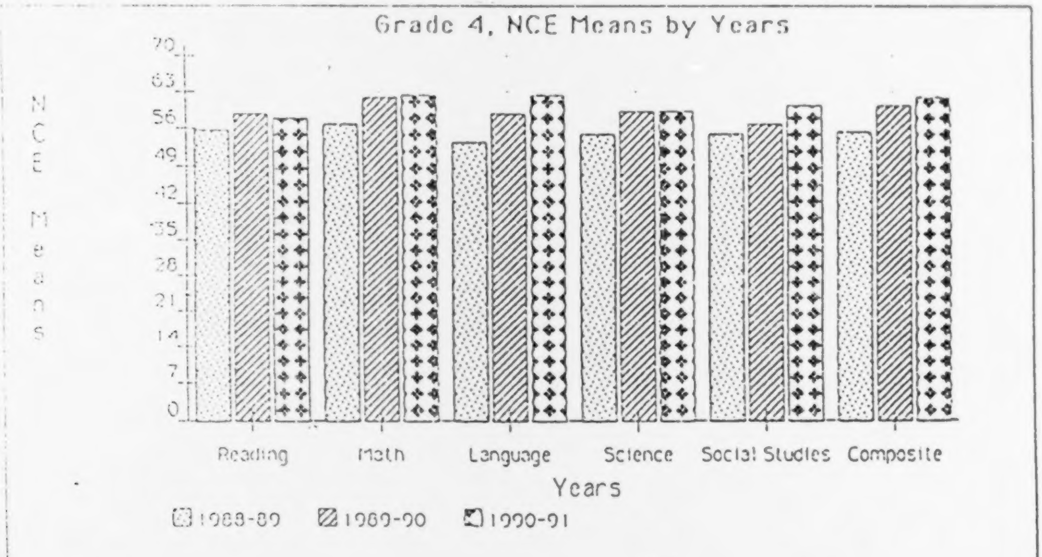

Table C-1

1. Knowledge: Which describes what you know about IT?

__(1)___ Nothing

__(2)___ Some general information

__(3)___ How to use IT on a daily basis

__(4)___ How to use IT for long term goals

__(5)___ How to use IT effectively

__(6)___ How to advise colleagues about using IT

__(7)___ Alternatives that can be used

__(8)___ How to develop new approaches in its use

Analysis of Variance for Item 1, Knowledge

School	Means	
	Pretest	Posttest
Farmersville	2.18	4.33
Hedges	1.86	4.08
Marrs	2.19	4.08
West	1.95	3.95
Total	2.03	4.09

	Analysis of Variance	
Source of Variance	F Ratio	Significance
Pretest vs Posttest	108.5	0.0001
Between Schools	0.7	0.56 (n.s)
Interaction	0	1.00 (n.s.)

Table C-2

2. Information: Which best describes what kind of information you are obtaining about IT?

__(1)___ Little or nothing

__(2)___ Opinions and knowledge of others

__(3)___ Ways to use IT

__(4)___ Ways IT can save time and work

__(5)___ Ways to use IT on an on-going basis

__(6)___ Different kinds of uses for IT

__(7)___ Ways to use IT with other teachers

__(8)___ Alternatives for using IT

__(9)___ Ways of using IT that have not been tried before

Analysis of Variance for Item 2, Information

School	Means	
	Pretest	Posttest
Farmersville	3.73	5.50
Hedges	3.21	5.69
Marrs	4.00	4.69
West	3.19	5.05
Total	3.50	5.21

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	39.23	0.0001
Between Schools	0.71	0.55 (n.s)
Interaction	1.64	0.18 (n.s.)

Table C-3

3. Communication: Which best describes your communication with others about IT?

__(1)___ Nothing

__(2)___ IT in general

__(3)___ Resources for starting to use IT

__(4)___ How to manage IT's use

__(5)___ The school system's requirements for using IT

__(6)___ How to use IT to help students

__(7)___ Ways to collaborate with other teachers on the use of IT

__(8)___ Developing new ways of using IT

Analysis of Variance for Item 3, Communication

School	Means	
	Pretest	Posttest
Farmersville	3.45	6.83
Hedges	3.46	6.69
Marrs	3.81	5.23
West	3.48	5.00
Total	3.56	5.81

	Analysis of Variance	
Source of Variance	F Ratio	Significance
Pretest vs Posttest	58.49	0.0001
Between Schools	2.70	0.05
Interaction	2.67	0.05

Table C-4

4. Assessing: Which best describes what you are concerned about regarding IT?

__(1)___ Nothing

__(2)___ Comparing different kinds of materials

__(3)___ Requirements for initial use

__(4)___ How to schedule and manage time for the use of IT

__(5)___ The school system's requirements for using IT

__(6)___ How to use IT to help students

__(7)___ Collaborating in the use of IT with other teachers

__(8)___ Advantages and disadvantages of alternatives to IT

__(9)___ New ways that IT can be used

Analysis of Variance for Item 4, Assessing

School	Means	
	Pretest	Posttest
Farmersville	4.91	8.50
Hedges	5.23	7.00
Marrs	4.69	5.46
West	5.29	6.35
Total	5.05	6.74

	Analysis of Variance	
Source of Variance	F Ratio	Significance
Pretest vs Posttest	25.56	0.0001
Between Schools	4.12	0.01
Interaction	2.51	0.06 (n.s.)

Table C-5

5. Planning: Which best describes your plans for using IT?

__(1)___ Not planning to use IT.

__(2)___ Gathering some information and resources.

__(3)___ The steps and resources necessary to use IT

__(4)___ How to use IT on a day to day basis

__(5)___ How to use IT on a on-going basis

__(6)___ How to use IT with other colleagues

__(7)___ Alternatives to using IT

__(8)___ Developing new ways that IT can be used

Analysis of Variance for Item 5, Planning

School	Means	
	Pretest	Posttest
Farmersville	4.27	6.58
Hedges	4.21	6.85
Marrs	4.25	5.31
West	4.14	5.50
Total	4.21	5.98

	Analysis of Variance	
Source of Variance	F Ratio	Significance
Pretest vs Posttest	59.79	0.0001
Between Schools	3.12	0.03
Interaction	2.12	0.10 (n.s.)

Table C-6

6. Status Report: Which best describes your current involvement?

__(1)___ Little or none

__(2)___ Orienting myself to what IT is and is not

__(3)___ Preparing to use IT

__(4)___ Organizing my time and schedules for the use of IT

__(5)___ Now using IT, but awkwardly

__(6)___ Now using IT comfortably

__(7)___ Using IT to improve student learning

__(8)___ Collaborating with other teachers in using IT

Analysis of Variance for Item 6, Status Report

School	Means	
	Pretest	Posttest
Farmersville	4.27	6.67
Hedges	2.57	6.31
Marrs	3.13	5.54
West	3.10	6.15
Total	3.19	6.16

	Analysis of Variance	
Source of Variance	F Ratio	Significance
Pretest vs Posttest	142.6	0.0001
Between Schools	4.59	0.005
Interaction	0.27	0.85 (n.s.)

Table C-7

7. **Performing:** Which best describes how you are using IT?

__(1)___ NOT learning about IT.
__(2)___ Just talking and reading about IT
__(3)___ Studying about IT
__(4)___ Using IT, but not well
__(5)___ Using IT WELL
__(6)___ Experimenting and exploring
__(7)___ Collaborating with others
__(8)___ Developing new ways to use IT

Analysis of Variance for Item 7,Performing

School	Means	
	Pretest	Posttest
Farmersville	4.18	6.17
Hedges	3.43	6.62
Marrs	3.19	5.46
West	3.20	5.50
Total	3.43	5.88

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	97.5	0.0001
Between Schools	3.5	0.02
Interaction	0.4	0.76 (n.s.)

Table C-8

Directions: Place a check mark to indicate where on the continuum between the two antonyms your feelings concerning IT lie.

Good 7 : 6 : 5 : 4 : 3 : 2 : 1 Bad

Analysis of Variance for Item 8, Good-Bad

School	Means	
	Pretest	Posttest
Farmersville	5.40	6.08
Hedges	6.31	6.38
Marrs	5.19	5.38
West	5.70	5.75
Total	5.64	5.88

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	1.11	0.29 (n.s.)
Between Schools	3.62	0.02
Interaction	0.29	0.83 (n.s.)

Table C-9

Directions: Place a check mark to indicate where on the continuum between the two antonyms your feelings concerning IT lie.

Threatening 1 : 2 : 3 : 4 : 5 : 6 : 7 Welcome

Analysis of Variance for Item 9, Threatening-Welcome

School	Means	
	Pretest	Posttest
Farmersville	5.70	6.17
Hedges	5.15	5.92
Marrs	4.69	4.69
West	4.75	5.75
Total	4.98	5.64

	Analysis of Variance	
Source of Variance	F Ratio	Significance
Pretest vs Posttest	4.44	0.04
Between Schools	2.57	0.06 (n.s.)
Interaction	0.29	0.83 (n.s.)

Table C-10

Directions: Place a check mark to indicate where on the continuum between the two antonyms your feelings concerning IT lie.

Beneficial 7 : 6 : 5 : 4 : 3 : 2 : 1 Worthless

Analysis of Variance for Item 10, Beneficial-Worthless

School	Means	
	Pretest	Posttest
Farmersville	5.70	6.33
Hedges	6.38	6.38
Marrs	5.37	5.23
West	5.90	5.40
Total	5.83	5.78

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	0.07	0.78 (negative) (n.s.)
Between Schools	4.99	0.003
Interaction	1.31	0.27 (n.s.)

Table C-11

Directions: Place a check mark to indicate where on the continuum between the two antonyms your feelings concerning IT lie.

Time-Saving __7__ : __6__ : __5__ : __4__ : __3__ : __2__ : __1__ Extra Work

Analysis of Variance for Item 11, Time Saving-Extra Work

School	Means	
	Pretest	Posttest
Farmersville	5.00	4.42
Hedges	5.46	5.38
Marrs	4.56	4.08
West	4.90	4.00
Total	4.95	4.41

	Analysis of Variance	
Source of Variance	F Ratio	Significance
Pretest vs Posttest	3.98	0.05 (negative)
Between Schools	3.06	0.03
Interaction	0.49	0.69 (n.s.)

Table C-12

Directions: Place a check mark to indicate where on the continuum between the two antonyms your feelings concerning IT lie.

Helpful___7_______:___6__:___5___:__4___:___3__:___2___:__1__Hindrance

Analysis of Variance for Item 12, Helpful-Hindrance

School	Means	
	Pretest	Posttest
Farmersville	6.30	6.58
Hedges	6.23	6.38
Marrs	6.00	5.69
West	6.21	5.60
Total	6.18	6.00

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	0.78	0.39 (negative) (n.s.)
Between Schools	2.10	0.10 (n.s)
Interaction	1.18	0.32 (n.s.)

Table C-13

Directions: Place a check mark to indicate where on the continuum between the two antonyms your feelings concerning IT lie.

Fascinating __7__:__6__:__5__:__4__:__3__:__2__:__1__ Boring

Analysis of Variance for Item 13, Fascinating-Boring

School	Means	
	Pretest	Posttest
Farmersville	6.20	6.58
Hedges	6.46	6.69
Marrs	5.50	5.54
West	6.10	5.85
Total	6.03	6.12

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	5.15	0.003
Between Schools	0.18	0.67 (n.s)
Interaction	0.44	0.73 (n.s.)

Table C-14

Directions: Place a check mark to indicate where on the continuum between the two antonyms your feelings concerning IT lie.

Positive __7__ : __6__ : __5__ : __4__ : __3__ : __2__ : __1__ Negative

Analysis of Variance for Item 14, Positive-Negative

School	Means	
	Pretest	Posttest
Farmersville	5.90	6.50
Hedges	6.50	6.38
Marrs	5.12	5.31
West	5.90	5.75
Total	5.81	5.95

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	6.89	0.001
Between Schools	0.48	0.50 (n.s)
Interaction	0.57	0.64 (n.s.)

Table C-15

Directions: Place a check mark to indicate where on the continuum between the two antonyms your feelings concerning IT lie.

Active___7______:___6__:___5___:__4___:___3__:___2___:__1__ Passive

Analysis of Variance for Item 15, Active-Passive

School	Means	
	Pretest	Posttest
Farmersville	4.90	5.62
Hedges	4.62	5.31
Marrs	4.12	4.77
West	4.85	5.25
Total	4.61	5.24

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	1.80	0.15 (n.s.)
Between Schools	5.44	0.02
Interaction	0	1.0 (n.s.)

Table C-16

Directions: Place a check mark to indicate where on the continuum between the two antonyms your feelings concerning IT lie.

Relaxed __7__ : __6__ : __5__ : __4__ : __3__ : __2__ : __1__ Tense

Analysis of Variance for Item 16, Relaxed-Tense

School	Means Pretest	 Posttest
Farmersville	4.90	5.62
Hedges	4.62	5.31
Marrs	4.12	4.77
West	4.85	5.25
Total	4.61	5.24

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	5.44	0.02
Between Schools	1.80	0.15 (n.s)
Interaction	0	1.0 (n.s.)

Table C-17

Student Progress

Directions: In this section, please estimate the number of students in your class who were able to accomplish the following tasks using a computer. Record percentages for before their instruction began (August, 1990) and the present time (May, 1991)

	Number of students	
How many of the students in your class could use computers to:	August 1990	May 1991
Write a story or report	-----	-----

Analysis of Variance for Item 17, Write a Story or Report

School	Means	
	Pretest	Posttest
Farmersville	15.58	89.69
Hedges	0.50	89.09
Marrs	11.15	72.31
West	7.18	72.95
Total	8.71	79.65

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	206.08	0.0001
Between Schools	1.36	0.26 (n.s)
Interaction	1.24	0.30 (n.s.)

Table C-18

Student Progress

Directions: In this section, please estimate the number of students in your class who were able to accomplish the following tasks using a computer. Record percentages for before their instruction began (August, 1990) and the present time (May, 1991)

	Number of students	
How many of the students in your class could use computers to:	August 1990	May 1991
Play games	-----	-----

Analysis of Variance for Item 18, Play Games

School	Means	
	Pretest	Posttest
Farmersville	45.18	91.08
Hedges	38.90	90.91
Marrs	59.08	93.69
West	60.94	85.58
Total	52.75	89.76

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	30.10	0.0001
Between Schools	0.43	0.74 (n.s)
Interaction	0.89	0.45 (n.s.)

Table C-19

Student Progress

Directions: In this section, please estimate the number of students in your class who were able to accomplish the following tasks using a computer. Record percentages for before their instruction began (August, 1990) and the present time (May, 1991)

	Number of students	
How many of the students in your class could use computers to:	August 1990	May 1991
Practice Math	-----	-----

Analysis of Variance for Item 19, Practice Math

School	Means	
	Pretest	Posttest
Farmersville	41.09	92.33
Hedges	48.00	100.0
Marrs	41.54	91.92
West	39.94	91.11
Total	42.18	93.35

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	73.93	0.0001
Between Schools	0.40	0.76 (n.s)
Interaction	0	1.0 (n.s.)

Table C-20

Student Progress

Directions: In this section, please estimate the number of students in your class who were able to accomplish the following tasks using a computer. Record percentages for before their instruction began (August, 1990) and the present time (May, 1991)

	Number of students	
How many of the students in your class could use computers to:	August 1990	May 1991
Learn to read better	-----	-----

Analysis of Variance for Item 20, Learn to Read Better

School	Means	
	Pretest	Posttest
Farmersville	18.64	84.42
Hedges	21.30	96.36
Marrs	16.85	77.15
West	14.53	85.26
Total	17.33	85.36

	Analysis of Variance	
Source of Variance	F Ratio	Significance
Pretest vs Posttest	189.2	0.0001
Between Schools	1.13	0.34 (n.s)
Interaction	0.18	0.91 (n.s.)

Table C-21

Student Progress

Directions: In this section, please estimate the number of students in your class who were able to accomplish the following tasks using a computer. Record percentages for before their instruction began (August, 1990) and the present time (May, 1991)

	Number of students	
How many of the students in your class could use computers to:	August 1990	May 1991
Learn about science	-------	------

Analysis of Variance for Item 21, Learn About Science

School	Means	
	Pretest	Posttest
Farmersville	10.45	66.17
Hedges	0.00	62.00
Marrs	9.54	52.46
West	6.82	65.84
Total	6.96	61.98

	Analysis	of Variance
Source of Variance	F Ratio	Significance
Pretest vs Posttest	73.24	0.0001
Between Schools	0.40	0.76 (n.s)
Interaction	0.33	0.81 (n.s.)

Table C-22

Student Progress

Directions: In this section, please estimate the number of students in your class who were able to accomplish the following tasks using a computer. Record percentages for before their instruction began (August, 1990) and the present time (May, 1991)

	Number of students	
	August 1990	May 1991
How many of the students in your class could use computers to:		
Do a science experiment	-----	-----

Analysis of Variance for Item 22, Do a Science Experiment

School	Means	
	Pretest	Posttest
Farmersville	7.73	27.50
Hedges	0.00	11.09
Marrs	0.77	20.69
West	3.00	22.21
Total	2.86	20.78

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	14.23	0.001
Between Schools	0.97	0.42 (n.s)
Interaction	0.16	0.92 (n.s.)

Table C-23

Student Progress

Directions: In this section, please estimate the number of students in your class who were able to accomplish the following tasks using a computer. Record percentages for before their instruction began (August, 1990) and the present time (May, 1991)

	Number of students	
How many of the students in your class could use computers to:	August 1990	May 1991
Learn to type	-----	-----

Analysis of Variance for Item 23, Learn to Type

School	Means	
	Pretest	Posttest
Farmersville	13.18	91.50
Hedges	1.70	94.09
Marrs	14.23	87.15
West	5.65	85.84
Total	8.69	89.04

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	405.41	0.0001
Between Schools	0.41	0.75 (n.s)
Interaction	1.06	0.37 (n.s.)

Table C-24

Student Progress

Directions: In this section, please estimate the number of students in your class who were able to accomplish the following tasks using a computer. Record percentages for before their instruction began (August, 1990) and the present time (May, 1991)

	Number of students	
How many of the students in your class could use computers to:	August 1990	May 1991
Send messages	-----	-----

Analysis of Variance for Item 24, Send Messages

School	Means	
	Pretest	Posttest
Farmersville	2.27	81.25
Hedges	1.00	80.00
Marrs	1.92	42.54
West	0.59	81.74
Total	1.37	72.02

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	188.28	0.0001
Between Schools	4.09	0.01
Interaction	2.96	0.04

Table C-25

Student Progress

Directions: In this section, please estimate the number of students in your class who were able to accomplish the following tasks using a computer. Record percentages for before their instruction began (August, 1990) and the present time (May, 1991)

	Number of students	
How many of the students in your class could use computers to:	August 1990	May 1991
Take notes	-----	-----

Analysis of Variance for Item 25, Take Notes

School	Means	
	Pretest	Posttest
Farmersville	2.73	29.17
Hedges	0.00	6.25
Marrs	1.54	36.67
West	1.18	26.64
Total	1.37	26.37

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	26.45	0.0001
Between Schools	1.69	0.17 (n.s)
Interaction	1.02	0.39 (n.s.)

Table C-26

Student Progress

Directions: In this section, please estimate the number of students in your class who were able to accomplish the following tasks using a computer. Record percentages for before their instruction began (August, 1990) and the present time (May, 1991)

	Number of students	
How many of the students in your class could use computers to:	August 1990	May 1991
Use a calculator	-----	-----

Analysis of Variance for Item 26, Use a Calculator

School	Means	
	Pretest	Posttest
Farmersville	0.91	33.67
Hedges	2.60	61.09
Marrs	7.31	51.15
West	11.59	38.84
Total	6.43	45.07

	Analysis of Variance	
Source of Variance	F Ratio	Significance
Pretest vs Posttest	35.12	0.0001
Between Schools	0.84	0.48 (n.s)
Interaction	1.10	0.35 (n.s.)

Table C-27

Student Progress

Directions: In this section, please estimate the number of students in your class who were able to accomplish the following tasks using a computer. Record percentages for before their instruction began (August, 1990) and the present time (May, 1991)

	Number of students	
	August 1990	May 1991
How many of the students in your class could use computers to:		
Check spelling	-----	-----

Analysis of Variance for Item 27, Check Spelling

School	Means	
	Pretest	Posttest
Farmersville	0.91	63.25
Hedges	0.00	35.45
Marrs	1.54	51.54
West	1.00	53.58
Total	0.92	51.58

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	60.36	0.0001
Between Schools	0.76	0.52 (n.s)
Interaction	0.60	0.62 (n.s.)

Table C-28

Student Progress

Directions: In this section, please estimate the number of students in your class who were able to accomplish the following tasks using a computer. Record percentages for before their instruction began (August, 1990) and the present time (May, 1991)

How many of the students in your class could use computers to:	Number of students August 1990	 May 1991
Do word processing	-----	-----

Analysis of Variance for Item 28, Do Word Processing

School	Means Pretest	 Posttest
Farmersville	9.09	81.67
Hedges	0.00	70.20
Marrs	2.69	79.23
West	3.76	57.16
Total	3.90	70.33

Source of Variance	Analysis of Variance F Ratio	 Significance
Pretest vs Posttest	128.24	0.0001
Between Schools	1.32	0.27 (n.s)
Interaction	1.03	0.39 (n.s.)

Table C-29

Student Progress

Directions: In this section, please estimate the number of students in your class who were able to accomplish the following tasks using a computer. Record percentages for before their instruction began (August, 1990) and the present time (May, 1991)

	Number of students	
How many of the students in your class could use computers to:	August 1990	May 1991
Plan his/her writing	-----	-----

Analysis of Variance for Item 29, Plan His/Her Writing

School	Means	
	Pretest	Posttest
Farmersville	7.27	77.83
Hedges	1.00	69.09
Marrs	3.46	58.46
West	3.18	46.89
Total	3.71	61.07

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	92.71	0.0001
Between Schools	1.83	0.15 (n.s)
Interaction	1.04	0.38 (n.s.)

Table C-30

Student Progress

Directions: In this section, please estimate the number of students in your class who were able to accomplish the following tasks using a computer. Record percentages for before their instruction began (August, 1990) and the present time (May, 1991)

	Number of students	
How many of the students in your class could use computers to:	August 1990	May 1991
Organize	-----	-----

Analysis of Variance for Item 30, Organize

School	Means	
	Pretest	Posttest
Farmersville	5.09	70.75
Hedges	0.20	64.73
Marrs	4.15	42.31
West	0.88	49.37
Total	2.49	55.44

Analysis of Variance

Source of Variance	F Ratio	Significance
Pretest vs Posttest	89.99	0.0001
Between Schools	1.61	0.19 (n.s)
Interaction	1.18	0.32 (n.s.)

Table D-1
Mean NCE Scores for Standardized Tests
Grade ONE, 1988-89

	Farmersville	Hedges	Marrs	West	Total
	(n=54)	(n = 52)	(n= 43)	(n = 72)	(n = 221)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	66.6	67.9	60.8	60.4	63.6
Total Math	76.8	79.9	73.7	73.6	75.9
Language	71.4	65.3	62.1	60.8	64.7
Social Studies	———	———	———	———	———
Science	———	———	———	———	———
Composite or Total Battery	———	———	———	———	———

Grade ONE, 1989-90

	Farmersville	Hedges	Marrs	West	Total
	(n=38)	(n = 34)	(n= 55)	(n = 67)	(n = 194)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	59.3	76.1	61.6	62.5	64.0
Total Math	77.3	84.6	79.0	74.7	78.2
Language	65.1	75.8	62.9	59.7	64.5
Social Studies	———	———	———	———	———
Science	———	———	———	———	———
Composite or Total Battery	———	———	———	———	———

Grade ONE, 1990-91

	Farmersville	Hedges	Marrs	West	Total
	(n=36)	(n = 31)	(n= 44)	(n = 45)	(n = 156)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	66.4	64.4	59.9	55.8	61.1
Total Math	71.1	76.1	71.5	67.4	71.1
Language	69.3	67.1	68.7	58.9	65.7
Social Studies	———	———	———	———	———
Science	———	———	———	———	———
Composite or Total Battery	———	———	———	———	———

Table D-2
Mean NCE Scores for Standardized Tests
Grade TWO, 1980-89

	Farmersville	Hedges	Marrs	West	Total
	(n=44	(n = 36)	(n= 60)	(n = 60)	(n = 200)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	61.8	60.5	68.5	62.3	63.7
Total Math	67.9	65.8	74.0	59.2	66.7
Language	65.8	69.1	74.6	65.8	69.0
Social Studies	—	—	—	—	—
Science	—	—	—	—	—
Composite or Total Battery	67.1	66.1	75.4	63.6	68.4

Grade TWO, 1989-90

	Farmersville	Hedges	Marrs	West	Total
	(n=54)	(n = 48)	(n= 40)	(n = 62)	(n = 209)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	65.6	60.8	59.7	58.5	61.1
Total Math	69.0	70.9	59.6	65.2	66.4
Language	74.3	66.2	68.5	65.1	68.4
Social Studies	—	—	—	—	—
Science	—	—	—	—	—
Composite or Total Battery	71.3	68.0	63.3	64.1	66.7

Grade TWO, 1990-91

	Farmersville	Hedges	Marrs	West	Total
	(n=40)	(n = 36)	(n= 47)	(n =62)	(n = 185)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	62.5	60.5	59.6	61.8	61.1
Total Math	72.0	64.9	55.1	61.6	62.8
Language	60.5	64.8	66.6	65.1	64.4
Social Studies	—	—	—	—	—
Science	—	—	—	—	—
Composite or Total Battery	66.4	64.6	60.7	63.9	63.7

Table D-3
Mean NCE Scores for Standardized Tests
Grade THREE, 1988-89

	Farmersville	Hedges	Marrs	West	Total
	(n=46)	(n = 50)	(n= 46)	(n =65)	(n = 207)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	64.6	59.1	60.0	62.0	61.6
Total Math	66.6	64.1	69.0	66.7	66.6
Language	77.5	67.4	69.9	71.2	71.4
Social Studies	______	______	______	______	______
Science	______	______	______	______	______
Composite or Total Battery	70.5	64.0	68.3	67.4	67.5

Grade THREE, 1989-90

	Farmersville	Hedges	Marrs	West	Total
	(n=48)	(n = 32)	(n= 60)	(n =67)	(n = 207)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	62.1	64.5	69.3	64.7	65.4
Total Math	69.0	68.9	74.3	66.9	70.1
Language	69.3	70.4	74.6	75.1	72.9
Social Studies	______	______	______	______	______
Science	______	______	______	______	______
Composite or Total Battery	67.4	69.4	74.9	69.8	70.7

Grade THREE, 1990-91

	Farmersville	Hedges	Marrs	West	Total
	n=52)	(n =47)	(n= 37)	(n =60)	(n =196)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	67.3	65.3	61.4	66.4	65.4
Total Math	67.8	66.9	70.8	60.6	65.9
Language	71.5	68.9	70.5	62.7	68.0
Social Studies	______	______	______	______	______
Science	______	______	______	______	______
Composite or Total Battery	70.2	68.6	69.2	64.0	67.7

Table D-4
Mean NCE Scores for Standardized Tests
Grade FOUR, 1988-89

	Farmersville	Hedges	Marrs	West	Total
	(n=47)	(n = 51)	(n= 53)	(n = 61)	(n = 212)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	51.6	52.5	58.3	57.3	55.1
Total Math	52.8	51.8	61.1	58.3	56.2
Language	48.1	49.7	56.5	55.4	52.7
Social Studies	50.5	52.5	61.1	53	34.4
Science	52.1	51.7	58.4	55.0	54.4
Composite or Total Battery	50.5	51.0	58.8	57.3	54.7

Grade FOUR, 1989-90

	Farmersville	Hedges	Marrs	West	Total
	(n=51)	(n = 50)	(n= 46)	(n =64)	(n = 211)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	59.4	56.2	60.0	58.2	58.4
Total Math	60.9	56.7	66.5	62.0	61.5
Language	60.7	56.5	66.5	56.9	58.2
Social Studies	55.2	57.2	58.9	54.2	56.2
Science	60.0	56.3	60.3	58.5	58.7
Composite or Total Battery	60.7	56.6	62.2	59.5	59.7

Grade FOUR, 1990-91

	Farmersville	Hedges	Marrs	West	Total
	(n=55)	(n =42)	(n= 60)	(n = 65)	(n = 222)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	56.3	57.3	62.0	54.4	57.5
Total Math	60.9	60.3	65.5	60.8	62.0
Language	62.9	60.2	65.7	58.3	61.8
Social Studies	59.5	57.0	65.0	57.0	59.8
Science	58.4	61.3	62.6	53.6	58.7
Composite or Total Battery	60.9	60.2	65.7	58.6	61.4

Table D-5
Mean NCE Scores for Standardized Tests
Grade FIVE, 1988-89

	Farmersville	Hedges	Marrs	West	Total
	(n-50)	(n-39)	(n= 56)	(n = 54)	(n = 199)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	55.3	52.2	62.4	53.2	56.1
Total Math	55.6	54.9	55.8	50.4	54.1
Language	58.7	56.8	61.1	50.2	56.7
Social Studies	64.1	58.1	62.0	53.2	59.4
Science	62.3	53.7	61.3	51.1	57.3
Composite or Total Battery	56.7	54.8	60.4	51.0	55.9

Grade FIVE, 1989-90

	Farmersville	Hedges	Marrs	West	Total
	(n-40)	(n-41)	(n= 54)	(n =67)	(n = 202)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	60.1	53.2	61.4	61.4	57.9
Total Math	62.7	56.6	65.7	60.0	61.4
Language	57.4	53.7	60.5	55.8	56.9
Social Studies	63.7	59.7	63.4	59.9	61.5
Science	62.7	54.4	63.6	58.9	60.0
Composite or Total Battery	60.3	54.2	62.7	58.0	58.9

Grade FIVE, 1990-91

	Farmersville	Hedges	Marrs	West	Total
	(n-51)	(n-64)	(n= 46)	(n =61)	(n = 222)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	64.9	48.5	56.8	56.7	56.2
Total Math	65.2	54.2	55.5	59.2	58.4
Language	73.6	55.6	56.3	58.6	60.7
Social Studies	62.5	51.1	53.7	58.4	56.3
Science	74.8	54.2	57.1	57.3	60.4
Composite or Total Battery	69.6	52.9	56.9	58.7	59.1

Table D-6
Mean NCE Scores for Standardized Tests
Grade SIX, 1988-89

	Farmersville (n-40) Mean	Hedges (n-40) Mean	Marrs (n=48) Mean	West (n =62) Mean.	Total (n = 190) Mean
Total Reading	60.8	56.4	62.2	58.2	59.4
Total Math	58.4	55.7	56.6	56.5	56.8
Language	61.5	57.1	65.2	60.8	61.3
Social Studies	- -	- -	- -	- -	- -
Science	- -	- -	- -	- -	- -
Composite or Total Battery	60.7	57.1	62.0	58.8	59.7

Grade SIX, 1989-90

	Farmersville (n-55) Mean	Hedges (n-32) Mean	Marrs (n= 51) Mean	West (n =46) Mean.	Total (n = 184) Mean
Total Reading	56.5	55.7	64.7	55.5	58.4
Total Math	61.6	57.9	62.3	48.7	57.9
Language	60.0	60.4	65.0	52.8	59.7
Social Studies	- -	- -	- -	- -	- -
Science	- -	- -	- -	- -	- -
Composite or Total Battery	59.6	58.6	64.7	52.2	59.0

Grade SIX, 1990-91

	Farmersville (n-40) Mean	Hedges (n-44) Mean	Marrs (n= 54) Mean	West (n =60) Mean.	Total (n = 198) Mean
Total Reading	66.7	57.3	62.5	59.4	61.3
Total Math	58.4	65.6	61.3	63.6	62.4
Language	56.4	59.6	59.9	59.1	58.9
Social Studies	- -	- -	- -	- -	- -
Science	- -	- -	- -	- -	- -
Composite or Total Battery	61.2	61.9	62.2	61.3	59.9

Table D-1
Mean NCE Scores for Standardized Tests
Grade ONE, 1988-89

	Farmersville	Hedges	Marrs	West	Total
	(n=54)	(n = 52)	(n= 43)	(n = 72)	(n = 221)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	66.6	67.9	60.0	60.4	63.6
Total Math	76.8	79.9	73.7	73.6	75.9
Language	71.4	65.3	62.1	60.8	64.7
Social Studies	———	———	———	———	———
Science	———	———	———	———	———
Composite or Total Battery	———	———	———	———	———

Grade ONE, 1989-90

	Farmersville	Hedges	Marrs	West	Total
	(n=38)	(n = 34)	(n= 55)	(n = 67)	(n = 194)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	59.3	76.1	61.6	62.5	64.0
Total Math	77.3	84.6	79.0	74.7	78.2
Language	65.1	75.8	62.9	59.7	64.5
Social Studies	———	———	———	———	———
Science	———	———	———	———	———
Composite or Total Battery	———	———	———	———	———

Grade ONE, 1990-91

	Farmersville	Hedges	Marrs	West	Total
	(n=36)	(n = 31)	(n= 44)	(n = 45)	(n = 156)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	66.4	64.4	59.9	55.8	61.1
Total Math	71.1	76.1	71.5	67.4	71.1
Language	69.3	67.1	68.7	58.9	65.7
Social Studies	———	———	———	———	———
Science	———	———	———	———	———
Composite or Total Battery	———	———	———	———	———

Table D-2
Mean NCE Scores for Standardized Tests
Grade TWO, 1988-89

	Farmersville	Hedges	Marrs	West	Total
	(n=44	(n = 36)	(n= 60)	(n = 60)	(n = 200)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	61.8	60.5	68.5	62.3	63.7
Total Math	67.9	65.8	74.0	59.2	66.7
Language	65.8	69.1	74.6	65.8	69.0
Social Studies	____	____	____	____	____
Science	____	____	____	____	____
Composite or Total Battery	67.1	66.1	75.4	63.6	68.4

Grade TWO, 1989-90

	Farmersville	Hedges	Marrs	West	Total
	(n=54)	(n = 48)	(n= 40)	(n = 62)	(n = 209)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	65.6	60.8	59.7	58.5	61.1
Total Math	69.0	70.9	59.6	65.2	66.4
Language	74.3	66.2	68.5	65.1	68.4
Social Studies	____	____	____	____	____
Science	____	____	____	____	____
Composite or Total Battery	71.3	68.0	63.3	64.1	66.7

Grade TWO, 1990-91

	Farmersville	Hedges	Marrs	West	Total
	(n=40)	(n = 36)	(n= 47)	(n =62)	(n = 185)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	62.5	60.5	59.6	61.8	61.1
Total Math	72.0	64.9	55.1	61.6	62.8
Language	60.5	64.8	66.6	65.1	64.4
Social Studies	____	____	____	____	____
Science	____	____	____	____	____
Composite or Total Battery	66.4	64.6	60.7	63.9	63.7

Table D-3
Mean NCE Scores for Standardized Tests
Grade THREE, 1988-89

	Farmersville	Hedges	Marrs	West	Total
	(n=46)	(n = 50)	(n= 46)	(n =65)	(n = 207)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	64.6	59.1	60.0	62.0	61.6
Total Math	66.6	64.1	69.0	66.7	66.6
Language	77.5	67.4	69.9	71.2	71.4
Social Studies	—	—	—	—	—
Science	—	—	—	—	—
Composite or Total Battery	70.5	64.0	68.3	67.4	67.5

Grade THREE, 1989-90

	Farmersville	Hedges	Marrs	West	Total
	(n=48)	(n = 32)	(n= 60)	(n =67)	(n = 207)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	62.1	64.5	69.3	64.7	65.4
Total Math	69.0	68.9	74.3	66.9	70.1
Language	69.3	70.4	74.6	75.1	72.9
Social Studies	—	—	—	—	—
Science	—	—	—	—	—
Composite or Total Battery	67.4	69.4	74.9	69.8	70.7

Grade THREE, 1990-91

	Farmersville	Hedges	Marrs	West	Total
	(n=52)	(n =47)	(n= 37)	(n =60)	(n =196)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	67.3	65.3	61.4	66.4	65.4
Total Math	67.8	66.9	70.8	60.6	65.9
Language	71.5	68.9	70.5	62.7	68.0
Social Studies	—	—	—	—	—
Science	—	—	—	—	—
Composite or Total Battery	70.2	68.6	69.2	64.0	67.7

Table D-4
Mean NCE Scores for Standardized Tests
Grade FOUR, 1988-89

	Farmersville	Hedges	Marrs	West	Total
	(n=47)	(n = 51)	(n= 53)	(n = 61)	(n = 212)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	51.6	52.5	58.3	57.3	55.1
Total Math	52.8	51.8	61.1	58.3	56.2
Language	48.1	49.7	56.5	55.4	52.7
Social Studies	50.5	52.5	61.1	53	34.4
Science	52.1	51.7	58.4	55.0	54.4
Composite or Total Battery	50.5	51.0	58.8	57.3	54.7

Grade FOUR, 1989-90

	Farmersville	Hedges	Marrs	West	Total
	(n=51)	(n = 50)	(n= 46)	(n =64)	(n = 211)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	59.4	56.2	60.0	58.2	58.4
Total Math	60.9	56.7	66.5	62.0	61.5
Language	60.7	56.5	66.5	56.9	58.2
Social Studies	55.2	57.2	58.9	54.2	56.2
Science	60.0	56.3	60.3	58.5	58.7
Composite or Total Battery	60.7	56.6	62.2	59.5	59.7

Grade FOUR, 1990-91

	Farmersville	Hedges	Marrs	West	Total
	(n=55)	(n =42)	(n= 60)	(n = 65)	(n = 222)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	56.3	57.3	62.0	54.4	57.5
Total Math	60.9	60.3	65.5	60.8	62.0
Language	62.9	60.2	65.7	58.3	61.8
Social Studies	59.5	57.0	65.0	57.0	59.8
Science	58.4	61.3	62.6	53.6	58.7
Composite or Total Battery	60.9	60.2	65.7	58.6	61.4

Table D-5

Mean NCE Scores for Standardized Tests

Grade FIVE, 1988-89

	Farmersville	Hedges	Marrs	West	Total
	(n-50)	(n-39)	(n= 56)	(n = 54)	(n = 199)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	55.3	52.2	62.4	53.2	56.1
Total Math	55.6	54.9	55.8	50.4	54.1
Language	58.7	56.8	61.1	50.2	56.7
Social Studies	64.1	58.1	62.0	53.2	59.4
Science	62.3	53.7	61.3	51.1	57.3
Composite or Total Battery	56.7	54.8	60.4	51.0	55.9

Grade FIVE, 1989-90

	Farmersville	Hedges	Marrs	West	Total
	(n-40)	(n-41)	(n= 54)	(n =67)	(n = 202)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	60.1	53.2	61.4	61.4	57.9
Total Math	62.7	56.6	65.7	60.0	61.4
Language	57.4	53.7	60.5	55.8	56.9
Social Studies	63.7	59.7	63.4	59.9	61.5
Science	62.7	54.4	63.6	58.9	60.0
Composite or Total Battery	60.3	54.2	62.7	58.0	58.9

Grade FIVE, 1990-91

	Farmersville	Hedges	Marrs	West	Total
	(n-51)	(n-64)	(n= 46)	(n =61)	(n = 222)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	64.9	48.5	56.8	56.7	56.2
Total Math	65.2	54.2	55.5	59.2	58.4
Language	73.6	55.6	56.3	58.6	60.7
Social Studies	62.5	51.1	53.7	58.4	56.3
Science	74.8	54.2	57.1	57.3	60.4
Composite or Total Battery	69.6	52.9	56.9	58.7	59.1

Table D-6
Mean NCE Scores for Standardized Tests
Grade SIX, 1988-89

	Farmersville	Hedges	Marrs	West	Total
	(n-40)	(n-40)	(n=48)	(n =62)	(n = 190)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	60.8	56.4	62.2	58.2	59.4
Total Math	58.4	55.7	56.6	56.5	56.8
Language	61.5	57.1	65.2	60.8	61.3
Social Studies	- -	- -	- -	- -	- -
Science	- -	- -	- -	- -	- -
Composite or Total Battery	60.7	57.1	62.0	58.8	59.7

Grade SIX, 1989-90

	Farmersville	Hedges	Marrs	West	Total
	(n-55)	(n-32)	(n= 51)	(n =46)	(n = 184)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	56.5	55.7	64.7	55.5	58.4
Total Math	61.6	57.9	62.3	48.7	57.9
Language	60.0	60.4	65.0	52.8	59.7
Social Studies	- -	- -	- -	- -	- -
Science	- -	- -	- -	- -	- -
Composite or Total Battery	59.6	58.6	64.7	52.2	59.0

Grade SIX, 1990-91

	Farmersville	Hedges	Marrs	West	Total
	(n-40)	(n-44)	(n= 54)	(n =60)	(n = 198)
	Mean	Mean	Mean	Mean.	Mean
Total Reading	66.7	57.3	62.5	59.4	61.3
Total Math	58.4	65.6	61.3	63.6	62.4
Language	56.4	59.6	59.9	59.1	58.9
Social Studies	- -	- -	- -	- -	- -
Science	- -	- -	- -	- -	- -
Composite or Total Battery	61.2	61.9	62.2	61.3	59.9

M. S. D. Mt. Vernon, Indiana

ABOUT

ME

AND

OUR

SCHOOL

GRADE LEVEL
K/1
FORM A

Directions: Please listen as your teacher reads each of the sentences below. Place a cross (X) on the face that agrees with how you feel.

ABOUT ME

	YES	DON'T KNOW	NO
1. I like the way I am.	☺	😐	☹
2. I like the way I look.	☺	😐	☹
3. People at school like me.	☺	😐	☹
4. I am very smart.	☺	😐	☹
5. I learn new things quickly.	☺	😐	☹
6. My clothes look nice.	☺	😐	☹
7. I live in a nice house.	☺	😐	☹
8. I can do very well in school.	☺	😐	☹
9. I feel good about myself.	☺	😐	☹
10. I can do things right.	☺	😐	☹

ABOUT FRIENDS

	YES	DON'T KNOW	NO
11. I have a lot of friends.	☺	😐	☹
12. I'm always nice to other people.	☺	😐	☹
13. I try to be nice to everybody.	☺	😐	☹
14. I like to share with others.	☺	😐	☹
15. I like to help people.	☺	😐	☹
16. I like other people.	☺	😐	☹
17. I know how to make other people feel good.	☺	😐	☹
18. I need to have friends.	☺	😐	☹
19. I like being around other people.	☺	😐	☹
20. I say nice things to people.	☺	😐	☹

ABOUT MY SCHOOL

	YES	DON'T KNOW	NO
21. All my friends like our school.	☺	😐	☹
22. School is exciting.	☺	😐	☹
23. School is my favorite place.	☺	😐	☹
24. My teachers always help me.	☺	😐	☹
25. School is my favorite place.	☺	😐	☹
26. Everyone likes school.	☺	😐	☹
27. School is a good place.	☺	😐	☹
28. I love to go to school.	☺	😐	☹
29. I like my school and my teacher.	☺	😐	☹
30. I am learning a lot at school.	☺	😐	☹

ABOUT COMPUTERS

	YES	DON'T KNOW	NO
31. I love to work with computers.	☺	😐	☹
32. Computers help me a lot.	☺	😐	☹
33. Everybody should study with a computer.	☺	😐	☹
34. Everyone likes computers.	☺	😐	☹
35. Computers help you more than anything else.	☺	😐	☹
36. My life is better because of computers.	☺	😐	☹
37. Computers are wonderful.	☺	😐	☹
38. I learn better with computers.	☺	😐	☹
39. I enjoy computers a lot.	☺	😐	☹
40. I love computers.	☺	😐	☹

	I can use computers to	YES	DON'T KNOW	NO
41.	write a story or report.	☺	😐	☹
42.	play games.	☺	😐	☹
43.	practice Math.	☺	😐	☹
44.	learn about Science.	☺	😐	☹
45.	do a Science experiment.	☺	😐	☹
46.	learn to type.	☺	😐	☹
47.	send messages.	☺	😐	☹

48. take notes. ☺ 😐 ☹

49. use a calculator. ☺ 😐 ☹

50. check spelling. ☺ 😐 ☹

51. do word processing. ☺ 😐 ☹

52. plan my writing. ☺ 😐 ☹

53. organize. ☺ 😐 ☹

54. learn to read better. ☺ 😐 ☹

M. S. D. Mt. Vernon, Indiana
Grade: ____________________

Name: ____________________
Teacher ____________________

ABOUT

ME

AND

OUR

SCHOOL

GRADE LEVEL
2/3
FORM A

Directions: Please listen as your teacher reads each of the sentences below. Place a cross (X) on the word that agrees with how you feel.

ABOUT ME

1. I like the way I am.	YES	DON'T KNOW	NO
2. I like the way I look.	YES	DON'T KNOW	NO
3. People at school like me.	YES	DON'T KNOW	NO
4. I am very smart.	YES	DON'T KNOW	NO
5. I learn new things quickly.	YES	DON'T KNOW	NO
6. My clothes look nice.	YES	DON'T KNOW	NO
7. I live in a nice house.	YES	DON'T KNOW	NO
8. I can do very well in school.	YES	DON'T KNOW	NO
9. I feel good about myself.	YES	DON'T KNOW	NO
10. I can do things right.	YES	DON'T KNOW	NO

ABOUT FRIENDS

11. I have a lot of friends.	YES	DON'T KNOW	NO
12. I'm always nice to other people.	YES	DON'T KNOW	NO
13. I try to be nice to everybody.	YES	DON'T KNOW	NO
14. I like to share with others.	YES	DON'T KNOW	NO
15. I like to help people.	YES	DON'T KNOW	NO
16. I like other people.	YES	DON'T KNOW	NO
17. I know how to make other people feel good.	YES	DON'T KNOW	NO
18. I need to have friends.	YES	DON'T KNOW	NO
19. I like being around other people.	YES	DON'T KNOW	NO
20. I say nice things to people.	YES	DON'T KNOW	NO

ABOUT MY SCHOOL

21. All my friends like our school. YES DON'T KNOW NO

22. School is exciting. YES DON'T KNOW NO

23. School is my favorite place. YES DON'T KNOW NO

24. My teachers always help me. YES DON'T KNOW NO

25. School is my favorite place. YES DON'T KNOW NO

26. Everyone likes school. YES DON'T KNOW NO

27. School is a good place. YES DON'T KNOW NO

28. I love to go to school. YES DON'T KNOW NO

29. I like my school and my teacher. YES DON'T KNOW NO

30. I am learning a lot at school. YES DON'T KNOW NO

ABOUT COMPUTERS

31. I love to work with computers. YES DON'T KNOW NO

32. Computers help me a lot. YES DON'T KNOW NO

33. Everybody should study with a computer. YES DON'T KNOW NO

34. Everyone likes computers. YES DON'T KNOW NO

35. Computers help you more than anything else. YES DON'T KNOW NO

36. My life is better because of computers. YES DON'T KNOW NO

37. Computers are wonderful. YES DON'T KNOW NO

38. I learn better with computers. YES DON'T KNOW NO

39. I enjoy computers a lot. YES DON'T KNOW NO

40. I love computers. YES DON'T KNOW NO

I can use computers to

41. write a story or report.	YES	DON'T KNOW	NO
42. play games.	YES	DON'T KNOW	NO
43. practice Math.	YES	DON'T KNOW	NO
44. learn to read better.	YES	DON'T KNOW	NO
45. learn about Science.	YES	DON'T KNOW	NO
46. do a Science experiment.	YES	DON'T KNOW	NO
47. learn to type.	YES	DON'T KNOW	NO
48. send messages.	YES	DON'T KNOW	NO
49. take notes.	YES	DON'T KNOW	NO

50. use a calculator. YES DON'T KNOW NO

51. check spelling. YES DON'T KNOW NO

52. do word processing. YES DON'T KNOW NO

53. plan my writing. YES DON'T KNOW NO

54. organize. YES DON'T KNOW NO

M. S. D. Mt. Vernon, Indiana

School: ____________________

Name: ____________________

Teacher____________________

ABOUT ME AND OUR SCHOOL

GRADE LEVEL
4/5
FORM A

Directions: Please listen as your teacher reads each of the sentences below. Place a cross (X) on the word that agrees with how you feel.

ABOUT ME

1. I like the way I am. YES DON'T KNOW NO

2. I like the way I look. YES DON'T KNOW NO

3. People at school like me. YES DON'T KNOW NO

4. I am very smart. YES DON'T KNOW NO

5. I learn new things quickly. YES DON'T KNOW NO

6. My clothes look nice. YES DON'T KNOW NO

7. I live in a nice house. YES DON'T KNOW NO

8. I can do very well in school. YES DON'T KNOW NO

9. I feel good about myself. YES DON'T KNOW NO

10. I can do things right. YES DON'T KNOW NO

ABOUT FRIENDS

11. I have a lot of friends. YES DON'T KNOW NO

12. I'm always nice to other people. YES DON'T KNOW NO

13. I try to be nice to everybody. YES DON'T KNOW NO

14. I like to share with others. YES DON'T KNOW NO

15. I like to help people. YES DON'T KNOW NO

16. I like other people. YES DON'T KNOW NO

17. I know how to make other people feel good. YES DON'T KNOW NO

18. I need to have friends. YES DON'T KNOW NO

19. I like being around other people. YES DON'T KNOW NO

20. I say nice things to people. YES DON'T KNOW NO

ABOUT MY SCHOOL

21. All my friends like our school.	YES	DON'T KNOW	NO
22. School is exciting.	YES	DON'T KNOW	NO
23. My teachers always help me.	YES	DON'T KNOW	NO
24. I would feel bad if we didn't have school.	YES	DON'T KNOW	NO
25. School is my favorite place.	YES	DON'T KNOW	NO
26. Everyone likes school.	YES	DON'T KNOW	NO
27. School is a good place.	YES	DON'T KNOW	NO
28. I love to go to school.	YES	DON'T KNOW	NO
29. I like my school and my teachers.	YES	DON'T KNOW	NO
30. I am learning a lot at school.	YES	DON'T KNOW	NO

ABOUT COMPUTERS

31. I love to work with computers. YES DON'T KNOW NO

32. Computers help me a lot. YES DON'T KNOW NO

33. Everybody should study with a computer. YES DON'T KNOW NO

34. Everyone likes computers. YES DON'T KNOW NO

35. Computers help you more than anything else. YES DON'T KNOW NO

36. My life is better because of computers. YES DON'T KNOW NO

37. Computers are wonderful. YES DON'T KNOW NO

38. I learn better with computers. YES DON'T KNOW NO

39. I enjoy computers a lot. YES DON'T KNOW NO

40. I love computers. YES DON'T KNOW NO

I can use computers to

41. write a story or report.	YES	DON'T KNOW	NO
42. play games.	YES	DON'T KNOW	NO
43. practice Math.	YES	DON'T KNOW	NO
44. learn to read better.	YES	DON'T KNOW	NO
45. learn about Science.	YES	DON'T KNOW	NO
46. do a Science experiment.	YES	DON'T KNOW	NO
47. learn to type.	YES	DON'T KNOW	NO
48. send messages.	YES	DON'T KNOW	NO
49. take notes.	YES	DON'T KNOW	NO
50. use a calculator.	YES	DON'T KNOW	NO
51. check spelling.	YES	DON'T KNOW	NO
52. do word processing.	YES	DON'T KNOW	NO

53. plan my writing. YES DON'T KNOW NO

54. organize. YES DON'T KNOW NO

Instructional Systems Status Survey

Name:_______________________________ School:_________________________

Grade Level or Subject Area:_______________________________________

Position in the School System: ____________________________________

Directions: For each of the statements below, check the phrase that best describes the status of your knowledge, skills, or attitude about Instructional Technology (IT).

1. Knowledge: Which describes what you know about IT?

_____ Nothing

_____ Some general information

_____ How to use IT on a daily basis

_____ How to use IT for long term goals

_____ How to use IT effectively

_____ How to advise colleagues about using IT

_____ Alternatives that can be used

_____ How to develop new approaches in its use

2. Information: Which best describes what kind of information your are obtaining about IT?

_____ Little or nothing

_____ Opinions and knowledge of others

_____ Ways to use IT

_____ Ways IT can save time and work

_____ Ways to use IT on an on-going basis

_____ Different kinds of uses for IT

_____ Ways to use IT with other teachers

_____ Alternatives to using IT

_____ Ways of using IT that have not been tried before

3. Communication: Which best describes your communication with others about IT?

_____ Nothing

_____ IT in general

_____ Resources for starting to use IT

_____ How to manage IT's use

_____ The school system's requirements for using IT

_____ How to use IT to help students

_____ Ways to collaborate with other teachers on the use of IT

_____ Developing new ways of using IT

4. Assessing: Which best describes what you are concerned about regarding IT?

_____ Nothing

_____ Comparing different kinds of materials

_____ Requirements for initial use

_____ How to schedule and manage time for the use of IT

_____ The school system's requirements for using IT

_____ How to use IT to help students

_____ Collaborating in the use of IT with other teachers

_____ Advantages and disadvantages of alternatives to IT

_____ New ways that IT can be used

5. Planning: Which best describes your plans for using IT?

_____ Not planning to use IT.

_____ Gathering some information and resources.

_____ The steps and resources necessary to use IT

_____ How to use IT on a day to day basis

_____ How to use IT on a on-going basis

_____ How to use IT with other colleagues

_____ Alternatives to using IT

_____ Developing new ways that IT can be used

6. Status Report: Which best describes your current involvement?

_____ Little or none

_____ Orienting myself to what IT is and is not

_____ Preparing to use IT

_____ Organizing my time and schedules for the use of IT

_____ Now using IT, but awkwardly

_____ Now using IT comfortably

_____ Using IT to improve student learning

_____ Collaborating with other teachers in using IT

7. Performing: Which best describes how you are using IT?

_____ NOT learning about IT.

_____ Just talking and reading about IT

_____ Studying about IT

_____ Using IT, but not well

_____ Using IT WELL

_____ Experimenting and exploring

_____ Collaborating with others

_____ Developing new ways to use IT

INSTRUCTIONAL TECHNOLOGY

Directions: Place a check mark to indicate where on the continuum between the two antonyms your feelings concerning IT lie.

Good ______:______:______:______:______:______:_____ Bad

Threatening ______:______:______:______:______:______:_____ Welcome

Beneficial ______:______:______:______:______:______:_____ Worthless

Time-Saving ______:______:______:______:______:______:_____ Extra Work

Helpful ______:______:______:______:______:______:_____ Hindrance

Fascinating ______:______:______:______:______:______:_____ Boring

Positive ______:______:______:______:______:______:_____ Negative

Active ______:______:______:______:______:______:_____ Passive

Relaxed ______:______:______:______:______:______:_____ Tense

Student Progress

Directions: In this section, please estimate the number of students in your class who were able to accomplish the following tasks using a computer. Record percentages for before their instruction began (August, 1990) and the present time (May, 1991)

	Number of students	
How many of the students in your class could use computers to:	August 1990	May 1991
Write a story or report		
Play games		
Practice math		
Learn to read better		
Learn about science		
Do a science experiment		
Learn to type		
Send messages		
Take notes		
Use a calculator		
Check spelling		
Do word processing		
Plan his/her writing		
Organize		

Name	s	gr	Pre	x1	x2	x3	x4	x5	x6	x7	gd	th	hlp	tim	fac	pos	act	rl	st	gam	math	read	Sc	exp	typ	mes	no	calc	sp	wd	pl	or	bn
Johnson	f	1	Pre	1	3	6	3	3	7	3	2	6	2	4	1	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Becker	f	2	Pre	2	3	2	6	5	7	4	4	7	1	1	1	1	3	5	5	25	10	0	0	0	0	0	0	0	0	0	0	0	1
Higgins	f	2	Pre	2	5	3	6	5	5	6	2	6	2	4	1	1	1	2	0	30	30	20	0	0	0	0	0	0	0	0	0	0	1
Allison	f	3	Pre	2	5	2	6	5	4	3	2	6	2	3	1	2	2	2	25	100	50	25	10	5	5	0	5	0	0	10	10	10	2
Middleton	f	3	Pre	2	4	3	6	4	3	6	3	6	2	3	1	2	2	1	25	50	75	50	50	25	75	25	25	0	0	25	25	0	2
Thompson	f	3	Pre	2	2	2	6	5	3	6	1	6	2	2	1	1	1	2	5	25	25	0	0	5	5	0	0	5	5	5	0	0	1
Givens	f	4	Pre	2	5	6	4	5	4	6	3	6	3	3	2	2	2	3	0	100	100	0	0	0	5	0	0	0	0	0	0	0	6
Herrmann	f	4	Pre	4	5	6	4	4	5	1									2	2	2	0	0	0	0	0	0	0	0	0	0	1	
Tiek	f	4	Pre	2	3	3	6	3	3	4	1	6	2	3	1	2	2	6	10	15	10	10	5	0	5	0	0	5	5	10	0	0	1
Mitchell	f	5	Pre	3	3	2	4	4	3	1	4	4	3	3	4	4	4	5	50	75	75	50	25	25	25	0	0	0	0	25	20	20	3
Whitehead	f	5	Pre	2	3	3	3	4	3	6	4	4	4	4	4	2	2	3	50	75	75	50	25	25	25	0	0	0	0	25	25	25	2
Upshaw	h	0	Pre	2	3	3	5	4	3	6	3	7	1	2	1	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Wood	h	0	Pre	2	3	4	6	4	3	6	1	6	1	2	2	1	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Levin	h	1	Pre	2	3	2	6	4	3	3	3	2	3	3	1	1	2	2	0	12	100	12	0	0	0	0	0	9	0	0	0	0	1
Reeves	h	1	Pre	2	3	2	6	5	2	3	3	2	3	5	4	4	2	5	0	17	100	11	0	0	0	0	0	17	0	0	0	0	1
Dorff	h	2	Pre	1	3	2	6	5	3	3	2	2	2	6	3	2		5															1
Jackson	h	2	Pre	2	3	2	4	4	3	4	1	7	1	1	1	1	1	1	0	60	0	0	0	0	0	0	0	0	0	0	0	0	1
Beebe	h	3	Pre	2	3	5	6	4	1	2	1	7	1	1	1	1	1	7															1
Martin	h	3	Pre	2	4	6	6	4	3	6	1	6	2	2	2	2	2	4	5	60	60	50	0	0	5	10	0	0	0	0	0	0	1
Putman	h	3	Pre	2	5	3	4	4	3	2	1	7	1	3	3	1	1	3	0	60	100	20	0	0	0	0	0	0	0	0	0	0	1
Custer	h	4	Pre	1	3	6	4	4	3	2	2	2	2	2	1	2	2	5	0	0	0	0	0	0	2	0	0	0	0	0	0	2	2
McDonald	h	4	Pre	2	2	2	6	5	2	2									0	100	100	100	0	0	0	0	0	0	0	0	0	0	
Moran	h	5	Pre	2	2	2	3	4	3	4	1	7	1	3	1	1	1	2															1
Moye	h	5	Pre	2	3			4	1	2	2	5	2	2	2	2	2	4															1
Wheatcroft	h	5	Pre	2	5	6	6	4	3	3	1	7	1	1	1	1	1	1	0	80	20	20	0	0	10	0	0	0	0	0	10	0	1
Droll	m	0	pre	2	3	6	6	5	3	3	1	7	2	2	1	1	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Martin	m	0	pre	2	3	3	3	4	3	3	2	3	3	5	2	2	2	5	0	50	0	0	0	0	0	0	0	0	0	0	0	0	3
Potter	m	1	pre	2	5	6	6	5	3	4	3	6	2	3	2	2	2	3	0	25	25	25	0	0	25	25	0	0	0	0	0	0	2
Roedel	m	1	pre	2	5	2	3	2	3	3	4	5	3	4	3	3	4	4	0	50	25	10	0	0	25	0	0	0	0	0	0	0	3
Klamer	m	2	pre	2	3	2	3	4	1	2	4	3	4	4	1	4	4	6	50	100	90	0	0	0	25	0	0	0	0	0	0	0	4
Wilson	m	2	pre	2	6	3	6	5	2	3	1	7	2	2	1	1	2	4	0	100	50	0	0	0	0	0	0	10	0	0	0	0	1
Wezet	m	3	pre	2	6	5	4	4	5	4	3	5	3	5		3	3	3	0	45	45	14	14	0	0	0	0	0	0	0	0	14	4
Frazer/Guy	m	3	pre	2	2	2	4	2	1	1	6	2	6	6	4	6	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Branson	m	4	pre	6	8	7	9	5	6	6	1	7	1	1	1	1	1	1	25	80	50	50	25	0	25	0	10	10	10	25	25	25	1
Torzewski	m	4	pre	2	3	4	5	5	3	2	4	4	4	4	4	4	4	4	10	70	30	10	10	10	10	0	10	10	0	0	0	0	4
Bush	m	4	pre	2	5	3	2	5	7	4	3	5	2	4	2	2	3	3	0	100	100	50	0	0	0	0	0	50	0	0	0	0	2
Lucas	m	5	pre	1	3	2	6	4	1	2	4	1	1	1	1	1	3	7	50	50	50	10	75	0	25	0	0	0	0	0	10	10	1
McMurtry	m	5	pre	2	3	2	3	4	1	1	5	5	5	5	3	5	5	6	10	98	75	50	0	0	50	0	0	15	10	10	10	5	4
Dorff	m	6	pre	2	3	4	4	4	5	4	1	2	1	3	2	2	2	5															1
Uebelhack	m	5	pre	2	3	2	4	5	3	6	2	6	2	5	2	2	2	2															2
Grinstead	m	6	pre	2	3	8	6	5	3	3	1	7	1	1	1	1	1	1															1
Pace	w	0	pre	1	3	[illegible]	6	4	3	4	4	3	3	3	2	4	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Rice	w	0	pre	2	3	4	6	4	3	3	1	7	1	1	1	1	1	2	0	24	24	24	24	24	0	0	0	0	0	0	0	0	1
Jesch	w	1	pre	2	3	5	3	5	3	3	3	5	3	4	3	3	3	3															3

Name	s	gr	Pre	x1	x2	x3	x4	x5	x6	x7	gd	th	hlp	tin	fac	pos	act	rl	st	gam	math	read	Sc	exp	typ	mes	no	calc	sp	wd	pl	or	bn
Mitchell	w	1	pre	2	3	6	9	2	7	4	1	7	1	1	1	1	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Jeffries	w	1	pre	3	3	3	4	5	3	4	4	4	4	5	3	3	3	4	0	6	6	6	0	0	0	0	0	6	0	0	0	0	4
Wilson	w	2	pre	2	1	2	4	4	3										0	100	100	0	0	0	0	0	0	0	0	0	0	0	
Berridge	w	2	pre	2	5	4	6	5	4	3	2	2	2	3	1	2	2	3	10	100	100	100	0	0	10	0	0	0	0	10	0	0	2
Tennison	w	2	pre	2	5	2	6	4	2	3	1	7	1	1	1	1	1	1	10	25	10	10	10	0	10	0	10	0	0	10	10	10	1
Ruminer	w	3	pre	2	5	3	4	5	5	6	2	6	2	4	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Gatewood	w	3	pre	2	2	3	6	4	3	2	1	7	1	4	1	1	1	2															1
Kramar	w	3	pre	2	5	6	9	5	4	6	1	7	1	4	1	1	1	1	5	100	25	0	1	0	5	0	0	0	0	0	0	0	1
Redwine	w	4	pre	2	3	2	4	3	2	2	1	7	1	3	1	1	2	3	0	100	10	10	10	0	0	0	0	0	0	0	0	0	1
Bachert	w	4	pre	2	2	2	3	4	2	2	2	6	2	2	1	1	1	4	0	91	68	0	0	0	0	0	0	45	0	0	0	0	2
Potter	w	4	pre	2	3	6	4	4	3	4	3	3	3	4	3	3	4	5	27	100	100	27	27	27	27	0	0	0	0	0	0	0	3
Biliman	w	5	pre	2	1	2	6	4	1	1	5	3	4	5	2	4	4	6															3
Baugh	w	5	pre	2	3	2	4	4	3	4	3	4	3	3	2	2	3	4	25	100	25	25	10	0	10	10	0	0	5	10	10	5	3
Nelson	w	5	pre	2	3	3	6	5	3	3	4	4	3	4	3	3	2	2	0	0	53	0	0	0	0	0	0	63	0	0	0	0	4
Hartman	w	5	pre	2	3	1	6	4	1	2	1	7	1	3	2	1	1	4	19	100	90	19	10	0	24	0	10	10	10	24	10	0	1
Anderson	w	5	pre	2	5	6	6	4	3	4	3	7	2	4	2	2	2	4	2	90	20	2	0	0	0	0	0	2	2	0	0	0	2
Custer	w	5	pre	2	3	4	3	4	4	3	2	6	3	3	3	2	2	3	24	100	48	24	24	0	10	0	0	71	0	10	24	0	2
Moyo	w		pre	1	3	2	6	4	3	1	2	6	1	1		1	3	4															1
Johnson	f	1	Post	3	6	8	9	8	7	6	2	6	2	5	2	2	2	2	0	18	18	18	0	0	18	0	0	0	0	0	0	0	1
Kingxxx	f	1	Post	3	3	6	9	4	6	6	1	7	1	2	1	1	1	3	80	100	100	100	0	0	100	80	0	0	0	0	0	80	1
Becker	f	2	post	3	4	6	9	5	6	6	2	5	2	2	1	1	1	2	95	75	90	100	4	4	100	10	0	0	4	100	100	100	2
Higgins	f	2	Post	6	6	8	9	9	7	6	3	5	3	5	2	2	3	2	100	100	100	100	100	0	100	100	0	0	0	100	100	100	5
Allison	f	3	Post	5	5	6	9	8	7	6	2	6	2	4	1	2	2	3	100	100	100	75	100	50	100	100	75	100	100	100	80	80	2
Middleton	f	3	Post	8	9	8	9	8	7	8	2	7	1	2	1	2	1	2	100	100	100	100	100	50	100	100	75	0	75	100	100	75	0
Thompson	f	3	Post	3	6	6	6	8	6	6	1	7	2	4	1	1	1	2	100	100	100	75	75	5	100	100	0	5	100	100	100	50	2
Givens	f	4	Post	4	6	8	9	8	5	6	2	6	2	6	2	2	2	2	100	100	100	95	50	16	100	100	50	89	100	100	74	74	2
Herrmann	f	4	Post	6	9	3	9	6	8	6	1	7	2	3	1	1	1	1	100	100	100	100	100	0	100	100	0	100	100	100	100	100	1
Tiek	f	4	Post	5	6	6	6	5	7	6	3	5	1	2	1	1	2	6	100	100	100	100	65	5	100	95	0	10	80	100	100	10	1
Mitchell	f	5	Post	3	3	6	9	5	7	6	2	6	1	4	2	1	1	3	100	100	100	75	100	100	80	100	75	50	100	90	90	90	1
Whitehead	f	5	Post	3	3	6	9	5	7	6	2	7	1	4	2	1	1	3	100	100	100	75	100	100	100	90	75	50	100	90	90	90	1
Upshaw	h	0	Post	5	5	6	4	4	7	6	2	6	1	2	1	1	2	2	90	100	100	90	90	0	75	75	0	50	0	0	0	0	1
Wood	h	0	Post	7	7	8	9	8	7	8	1	6	1	4	1	1	1	2	50	100	100	100	100	0	100	25	0	0	0	25	0	0	1
Levin	h	1	Post	5	5	6	8	5	7	6	1	7	1	1	1	1	1	1	100	100	100	100	0	0	100	100	0	100	0	100	100	100	4
Reeves	h	1	Post	2	5	90	4	5	6	6	1	5	1	5	1	1	1	3	90	100	100	100	100	0	100	100	0	97	0	97	100	100	1
Dorff	h	2	Post	3	9	6	9	8	7	8	2	3	3	6	2	2	2	5															1
Jackson	h	2	Post	5	5	8	9	8	6	6	1	7	1	1	1	1	1	1	100	100	100	100	50	0	100	50	0	75	90	100	80	80	1
Beebe	h	3	Post	3	3	4	7	8	3	6	1	7	1	1	1	1	1	7															1
Martin	h	3	Post	3	8	6	9	8	6	6	1	6	2	2	3	1	3	4	50	100	100	80	0	0	80	30	0	0	0	0	0	0	2
Putman	h	3	Post	5	5	7	4	8	7	6	1	7	2	3	2	1	1	2	100	100	100	100	0	0	100	100	0	0	0	100	100	100	1
Custer	h	4	Post	5	5	7	6	8	6	8	2	2	22	2	2	2	2	2	100	0	100	100	100	0	100	100	50	50	100	80	80	50	2
McDoonald	h	4	Post	2	5	7	4	4	5	4	5	7	3	3	2	2	3	3	100	100	100	100	100	0	100	100	##	100	0	100	100	100	2
Moran	h	5	Post	4	6	6	9	8	7	8	2	7	2	3	3	2	2	2	100	100	100	100	72	72	100	100	##	100	100	###	100	82	2
Wheatcroft	h	5	Post	4	6	7	9	7	8	8	1	7	1	1	1	1	1	1	100	100	100	90	70	50	80	100	##	100	100	100	100	100	1
Ruth Martin	m	0	Post	5	3	5	6	4	4	4	4	3	4	4	3	4	5	4	0	100	100	5	0	0	98	0	0	0	0	0	0	0	3

Name	g	gr	Pre	x1	x2	x3	x4	x5	x6	x7	gd	th	hlp	tim	fac	pos	act	rl	st	gam	math	read	Sc	exp	typ	mes	no	calc	sp	wd	pl	or	bn
Droll	m	0	post	5	6	6	4	4	7	6	1	7	1	4	1	1	2	3	100	100	100	100	0	0	100	0	0	0	0	100	0	0	1
Peggy Roed	m	1	post	7	5	2	2	5	6	6	4	4	4	4	4	4	4	4	50	100	100	100	0	0	100	100	50	0	0	100	0	25	4
Cheryl Pott	m	1	post	3	5	6	4	8	4	6	2	6	2	5	2	2	1	4	100	100	100	100	100	0	100	100	##	25	0	100	100	100	2
Klamer	m	2	post	3	5	6	8	5	6	6	1	6	1	3	1	1	1	3	90	100	100	100	0	0	75	0	0	100	100	90	100	0	1
Wilson	m	2	post	5	5	6	5	5	5	4	4	4	4	4	1	1	3	3	52	100	100	100	0	0	100	0	0	75	25	100	100	75	3
Wezet	m	3	post	4	5	4	6	5	6	6	2	5	3	5	3	3	3	3	73	100	100	73	82	45	100	23	0	0	45	45	70	55	4
Frazer	m	3	post	3	3	7	4	5	5	4	4	4	4	4	4	4	4	4	20	20	20	20	20	0	20	20	20	20	20	20	20	20	4
Torzewski	m	4	post	3	6	4	6	5	7	5	2	2	2	3	2	2	2	2	100	100	100	90	100	10	90	0	70	90	100	100	90	90	2
Branson	m	4	post	6	7	8	9	5	8	8	1	7	1	1	1	1	1	1	95	100	100	95	95	24	100	100	80	80	100	100	80	80	1
Bush	m	4	post	3	3	2	9	5	4	5	3	5	3	4	2	2	2	2	95	100	100	95	95	40	80	50	95	95	95	95	80	0	3
Mona Lucas	m	5	Post	3	3	6	4	5	4	6	4	4	4	6	5	5	5	5	75	100	75	30	90	50	80	75	50	90	100	95	40	40	4
Marilyn M	m	5	post	3	5	6	4	8	6	5	2	4	3	4	1	2	2	4	90	98	100	95	100	100	90	85	75	90	85	85	80	65	2
Pace	w	0	post	2	9	2	4	2	2	2	4	4	4	3	4	4	4	4	90	100	100	50	50	0	100	100	0	0	0	0	0	50	4
Rice	w	0	post	3	5	4	2	8	6	5	4	6	4	4	3	2	2	3	100	100	100	100	24	24	100	100	0	0	0	0	0	0	2
Jesch	w	1	post	3	3	5	4	8	7	8	4	5	3	3	5	4	3	3	0	100	100	100	0	0	100	0	0	0	0	0	0	0	3
Mitchell	w	1	post	4	5	4	5	4	4	6	1	7	1	1	1	1	1	2	10	15	15	15	8	0	15	15	10	7	15	0	0	15	1
Jeffries	w	1	post	3	3	6	9	4	7	6	3	5	4	7	4	3	3	4	6	16	16	16	6	0	16	8	0	16	15	6	6	6	3
Berridge	w	2	post	4	5	6	8	5	5	6	2	6	2	4	2	2	2	4	50	100	100	100	100	0	100	100	##	0	0	100	0	0	2
Wilson	w	2	post	3	5	4	4	5	5	4	4	4	4	7	1	1	1	4	45	100	100	68	0	0	100	100	##	0	0	0	0	0	4
Tennison	w	2	post	5	6	6	9	4	7	6	1	7	1	7	2	2	2	2	95	100	100	90	50	0	100	100	90	0	75	90	90	75	1
Wylam	w	3	post	5	3	6	5	8	7	6	1	7	1	1	1	1	1	1	5	100	100	100	100	1	90	80	1	0	0	1	100	100	1
Ruminer	w	3	post	7	9	7	9	7	7	6	1	7	1	2	1	1	1	1	100	100	100	100	100	24	100	100	24	19	100	100	100	100	1
Kramer	w	3	post	5	3	6	9	5	7	6	1	7	1	4	1	1	1	1	100	100	100	100	100	0	100	100	##	0	100	75	100	100	1
Bachert	w	4	post	5	6	6	9	5	6	6	1	7	3	4	2	2	2	2	100	100	100	91	23	0	100	100	0	100	91	100		68	2
Redwine	w	4	post	3	6	4	7	8	7	6	1	7	1	2	1	1	1	1	100	100	100	100	100	0	100	75	0	100	95	100	10	10	1
Potter	w	4	post	3	5	6	6	5	7	6	3	5	3	5	3	3	3	3	100	100	100	100	100	100	100	100	##	100	100	64	64	64	3
Billman	w	5	post	5	5	6	6	5	7	5	2	5	2	5	2	1	2	2															1
Baugh	w	5	post	3	5	6	6	5	5	4	3	4	4	5	3	3	4	3	100	100	100	100	100	50	100	100	90	90	90	100	50	10	3
Nelson	w	5	post	3	3	5	8	4	7	6	4	4	5	5	4	4	4	4	100	0	100	100	100	100	100	100	##	100	100	100	63	79	4
Anderson	w	5	post	5	5	6	9	8	7	5	2	6	2	2	3	1	2	3	99	95	100	100	100	75	100	75	20	20	50	60	75	80	1
Custer	w	5	post	3	3	2	4	5	7	5	2	5	3	4	4	4	4	4	100	100	100	100	100	0	10	100	48	100	100	100	100	100	2
Hartman	w	5	post	5	6	3	4	5	6	6	1	7	3	4	1	2	2	4	86	100	100	90	90	48	100	100	90	86	85	90	86	81	2